User's Guide™

THE MAGAZINE FOR CP/M & MS-DOS COMPUTER USERS

No. 9 $4

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Hard Disk System

Circle number 3 on the reader service card.

User's Guide™

User's Guide Number 9 (Volume 2.3)
July 1984

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About the Cover

The chariot master is ready to unleash his four horses. This frieze from a Corinthian workshop in 575 B.C. suggested to us the theme of concurrent operations in a single computer. Cover art is by Chrisann Brennan.

The tutorials in this issue introduce and explain concurrency and show in detail the multiple-user version of CP/M-86 called MP/M-86, and the multiple-task version for a single user called Concurrent CP/M-86. We also cover the Zeus 4 "network-in-a-box" system.

Contents...

EDITORIAL

Bug Awareness **4**
Warranties and guarantees to stave off bug paranoia.

USER FORUM

User Friendly or User Useless? **12**

FOR STARTERS

Multiple Users and Multiple Computers **5**
How computer systems are linked together to share programs, data, printers, modems and system resources.

SPECIAL

The Sleaze Patrol **18**
This first installment of a special column deals with the double-dealing duplicity perpetrated by mendacious mountebanks and bamboozlers...
by Arthur Naiman

SYSTEM OVERVIEWS

The OSM Zeus 4 Multiple-User Network **21**
Four computers linked in a network for sharing a hard disk and several printers.
by Tony Bove & Cheryl Rhodes

Ampro Bookshelf Computer **64**
The Ampro Series 100 packs big performance in a small size.
by Jerry Haigwood

PRODUCT ANNOUNCEMENTS **70**
Computers, systems, software, networks, peripherals...

ADVERTISER INDEX **76**

Issue 9 (Vol. 2.3)

TUTORIALS

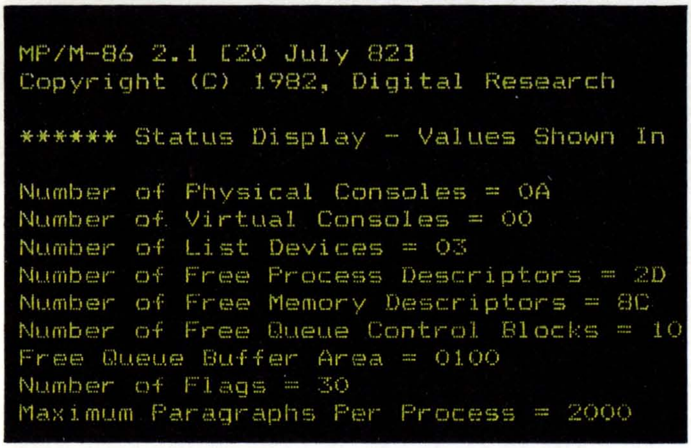
The Meaning of Concurrency **24**
An overview of the concurrency features of the Concurrent CP/M-86 and MP/M-86 operating systems.
by Jonathan Sachs

Concurrent CP/M-86 and MP/M-86: Files, Disks, Spooling and Printing **50**
This installment describes file attributes, system disk usage, concurrent printing and more.
by Jonathan Sachs

Concurrent CP/M-86: DEC Rainbow Version **34**
Details on the DEC Rainbow version of Concurrent CP/M-86.
by Jonathan Sachs

Concurrent CP/M-86: IBM PC Version **37**
Details on the IBM PC version of Concurrent CP/M-86.
by Jonathan Sachs

MP/M-86: CompuPro Version **48**
Details on MP/M-86 for CompuPro computers.
by Jonathan Sachs



```
MP/M-86 2.1 [20 July 82]
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****** Status Display - Values Shown In

Number of Physical Consoles = 0A
Number of Virtual Consoles = 00
Number of List Devices = 03
Number of Free Process Descriptors = 2D
Number of Free Memory Descriptors = 8C
Number of Free Queue Control Blocks = 10
Free Queue Buffer Area = 0100
Number of Flags = 30
Maximum Paragraphs Per Process = 2000
```

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EVALUATIONS

A NewWord Is Spoken **6**
Is NewWord the last word in word processing?
By Thomas Howe

Bible Study By Computer: THE WORD Processor **14**
The entire King James Version on floppy disks, ready for research.
by Thomas Howe

Watch Your Language With Punctuation & Style **60**
A review of the Punctuation & Style proofreading and copy editing programs.
by Steve Rosenthal

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Bug Awareness

Warranties, guarantees and other offers are being extended to consumers who are fast becoming aware of the inherent nature of software bugs.

After a five-year history of booming personal computer software sales, the industry has finally spawned an awareness of the consumer's right to a "bug-free" product. A few firms are offering warranties or money-back guarantees, although the majority of software publishers sell you software without any guarantees.

For the last five years, about the best guarantee you could get was your money back if you tried the demo and didn't like it (as long as you didn't crack the seal on the real disk).

Meanwhile, public domain software slumbered on the market. Andrew Fluegelman (Headlands Press) marketed his PC-Talk through this network, and eventually made a profit by giving away a good program and asking for a $35 contribution "if you find it useful." Freeware® (Headlands Press) emerged as the latest phenomenon in software distribution.

PC-Talk III (third version) is now one of the most popular communications programs for the IBM PC. It has the ultimate guarantee: pay only if you find it useful.

A more modest guarantee — one you would find in many audio stores and auto dealers — is the one-year warranty by Champion Software for its Champion accounting package. If the software doesn't perform as described due to some inconsistency or defect, Champion will either correct the problem (usually by providing replacement software) or refund your money.

A more outlandish offer from the Computer Tax Service is getting considerable press attention: for $30 you can "beta test" a new program called Money Street, which when released will retail for $100. "Testers" are encouraged to find the bugs in the "beta test" version, and they get the final version free.

People are attracted to this offer because they actually learn something about software and at the same time are purchasing a useful program at 30% of its retail price.

What is also happening is a consumer awareness of bugs in the product. Some of the oldest programs on the market are not bug free, and some well known and popular programs have hidden bugs that can cause damage to your data.

Anyone with experience using computers, from personal computers to large mainframes, knows of the complex nature of software and that bugs are inevitable. Experienced software buyers have traditionally not sued for refunds if the software had bugs. Consumers, however, remember the money-back guarantees and warranties they get with hardware and appliances, and demand better treatment when confronted with confounding software bugs.

You know the kind. They appear unexpectedly, when a project is due and you're pumping it out at the last minute. You spend an hour trying to index an eight-kilobyte data base only to find that the indexing didn't work properly. You have to spend several more hours cutting your data base into smaller chunks to be indexed.

Or the dummy invoice trick. You must know this one. The accounting package prints the first invoice on the pre-printed form in all the right places. Then, for some inexplicable reason, it advances one extra line and ruins all subsequent invoices in the queue by exactly one line. Of course, you find this out after trying to print a hundred invoices (you also find that you can't interrupt the program or you screw up your general ledger!). So you line up the first invoice to be printed one line above normal and you create a dummy invoice to be the first one.

You may have learned to adapt to a program's inconsistencies, but as the industry matures everyone will expect more from application programs. Publishers will have to offer warranties or guarantees of some kind, or drop their prices considerably.

For information about these products and warranties: Champion Software, 66 South Van Gordon, Suite 155, Lakewood CO 80228, phone (303) 987-2588; Computer Tax Service, Box 4845, Incline Village, NV 89450, phone (702) 831-4300 (to be a Money Street "tester" send $30 to CTS, Box 7915-R, Incline Village, NV 89450); Headlands Press (PC-Talk III), Box 862, Tiburon, CA 94920 ($35 suggested donation).

We'd like to take this opportunity to explain our new sections and columns.

We have changed the name of our "personal opinion" pieces to "evaluations." They have become more than mere opinions of how well or how poorly a software product performs.

Evaluations in *User's Guide* are not short, quickly-dashed-off pieces with arbitrary ratings. Systems and soft-

Editorial *continued on page 76.*

Multiple Users, and Multiple Computers

How computer systems are linked together to share programs, data, printers, modems and system resources.

The four-horse chariot on the cover and multi-user computers may have no connection for you (other than it may all sound Greek to you), but it reminds us of a system we describe in this issue. The system has four computers in one box, controlled by a master computer. The four computers can be used by people at four different keyboard/display units (terminals). They can run the same programs at the same time and use the same data. They can also use the same modems and printers.

The system, the OSM Zeus 4, is described as a "network-in-a-box." The Zeus design is fundamentally different than most multi-user systems that provide the same functions. For example, the CompuPro 8:16 multi-user system provides *one computer* for up to eight users at eight different terminals. This design permits the users to also share the same data and use the same programs at the same time.

How would you compare the two? The Zeus 4 system provides four eight-bit computers for four users, whereas the CompuPro provides one sixteen-bit computer for one to eight users. The differences are in flexibility and throughput. The Zeus 4 will process data at the same speed no matter if one or four users are on the system, and each computer in the box is still limited to 64K internal memory. The CompuPro, on the other hand, moves very fast for one to three people, and slows down considerably as you add more people, but provides a sixteen-bit computer that can use up to a megabyte of internal memory.

What does that mean to you? If you use the Zeus 4, you can run standard eight-bit CP/M software and share data with three other users. If you use the CompuPro 8:16, you can run both standard eight-bit CP/M software and the new sixteen-bit CP/M-86 software, taking advantage of more internal memory for running larger programs. And you can still share data with up to eight other users. There are more differences, but these are the fundamental ones.

This issue includes a tutorial on two CP/M-compatible operating systems (Concurrent CP/M-86 and MP/M-86) that provide the ability to share programs and data among several users. Included with the tutorial are specific sections on how to use variations of these systems on the IBM Personal Computer, the DEC Rainbow and the CompuPro 8:16 and CompuPro 10.

Also included in this issue is a system overview of the OSM Zeus 4 system. Again, the focus is on sharing data among users.

There are many ways to share data, some of them expensive and complex (for good reasons), some of them inexpensive and not too complex. Let's explore the ways in which data is shared between today's home and office computers, and briefly touch on the history of multiple-user systems to provide a background and context for the terminology.

Data Sharing Today: Home and Office Computers

Imagine you work for a corporation that has a computer at the office, and you are a personal computer user, at home doing financial planning on a spreadsheet. To share that data with the corporate computer, you need to establish a communications link with that computer, most likely over a telephone line.

You would use a *modem* (device that lets your computer send and receive data over a telephone line), and *communications software* that works with your modem.

Chances are, your communications software will not match exactly the software your corporate computer uses for communications. Chances are also very high that the corporate computer is not a personal computer running the same software as your home computer — and the corporate computer probably can't read your spreadsheet program's data directly from the spreadsheet.

Therefore, you will probably have to change the data into a "text file" form that can be read by almost any computer. In some spreadsheet programs you select the option that produces a printed report only stored in a disk file, not printed. The result is usually a text file you can then transmit, via modem, to your corporate computer. Of course,

For Starters *continued on page 67.*

CP/M-80 •
CP/M-86 •
PC-DOS •
MS-DOS •

A NewWord Is Spoken

"Anyone familiar with WordStar® can use NewWord® immediately" — Is NewWord the last word in word processing?

In the late fall of 1983, Rocky Mountain Software Systems got my attention with a snazzy mailer they sent to Kaypro users. They offered to trade our present word processing software and $100 for their newest offering: NewWord. This was prefaced with a substantial advertising campaign in lots of computer magazines.

It must have worked; I understand they sell as fast as they can be minted. I also heard that NewWord is being bundled with Morrow Micro-Decision computers. Reports I have from 2 Morrow dealers in San Francisco are quite positive about this move.

While I did not take them up on the trade in offer (I still like Perfect Writer for some jobs, believe it or not!), I did ask for a look at the new product. NewWord claims to have some advantages over WordStar, curing some of the annoyances. Yet, it claimed to have essentially the same command structure — experienced WordStar users should not have to learn all over again. My curiosity was high and I wanted to see if this was for real.

I described in my comparison of WordStar and Perfect Writer in issue #6 of *User's Guide* ("WordStar vs. Perfect Writer") some things about WordStar that bothered me. For instance, cursor movements seemed flakey (the arrow keys on my Kaypro coughed up menus instead of moving the cursor), file saving was clumsy, and product support was underwhelming. Rocky Mountain Software (RMS) boldly claimed to have all this well in hand. Do they? Mostly yes, but there are improvements to the WordStar-like product that they didn't make.

NewWord offers a built in merge-printing feature at no extra charge. It seemed an economical alternative to buying both WordStar and MailMerge (both from MicroPro, Intl.). I wanted something inexpensive to do mailings for my church. It also had to be something others could easily learn. I re-

NewWord

NewWord was written by NewStar Software, Inc. and is marketed by Rocky Mountain Software, Systems, P. O. Box 3282, Walnut Creek, California 94598-0282. Phone: (415) 680-8378. Available for CP/M, MS-DOS, and PC-DOS. A "WordStar-alike" writing tool for $250. (Version 1.18)

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by Thomas Howe

NewWord offers a built in merge-printing feature at no extra charge. It seemed an economical alternative to buying both WordStar and MailMerge.

quired a package that is both straightforward and powerful.

To test the product with a reasonable task, I produced a small set of form letters and a batch of mailing labels. As a result, I believe that anyone who is familiar with WordStar can learn how to use NewWord inside of an hour.

Also, I helped a friend experiment with NewWord's footnoting and other text formatting abilities. He needs to produce term papers that satisfy the Turrabian style manual.

Piracy Protection

NewWord is marketed in a unique fashion. RMS is excited about piracy protection. They ship you a disk that has been locked up and rendered useless. If you try to use a locked disk, all you get is a blaring error message telling you to call Rocky Mountain Software for the codes to unlock it. If that copy is not yours and you call, the phone wires may even get a little warm.

They say this is an attempt to market software at a reasonable price and still make money. The idea is to discourage thieves. If the software is both inexpensive (comparatively speaking) and tough enough to copy, the theory is that it won't be worth the trouble to steal it. Only time will tell if they are right.

To unlock your copy, look for an "800" number inside the package. Call this number and a technician will guide you one step at a time to a working copy of your NewWord. You have to be at your computer running UNLOCKNW.COM (type `UNLOCKNW`). There are three steps. Each involves an exchange of information between you and Rocky Mountain Software.

First, you give your name and the serial number of your NewWord. They check their records to verify ownership and then tell you how to enter the unlocking program. You are told how to personalize your software to become permanently identified with your name.

Finally they give you two code sequences generated by their computer in conjunction with codes your computer generates. When you enter these codes correctly, your screen glowingly announces that NewWord is unlocked and you are on your way.

Being the amateur hacker and generally all-round curious cat that I am, I tried to break the unlocking sequence with DDT prior to calling RMS. Though I figured out the first step (it's not that hard), the rest is dependent on computer generated codes.

I suppose that if you did not have anything better to do for a month, you might be able to come up with the algorithms used to lock it up. Since time is more precious than that, it isn't worth the trouble. If you do figure it out, consider writing them (anonymously?) to tell them how to do a better job concealing the codes.

There is one bit of fertilizer in their "Piracy Protection Notice." I have real doubts about this statement: "Once you have unlocked your software, it will only work on the computer you unlocked it with."

Maybe I am profoundly ignorant (no amens, please), but I know of no way to key CP/M software to a particular machine unless it looks for and verifies the serial number (embedded by Digital Research, Inc.) on your copy of CP/M. It is true that a Digital Research utility supplied with CP/M (MOVCPM.COM) is keyed to your serial number, but is it possible for an application program to be keyed in this fashion?

If indeed this is the case and somebody tried to put his CP/M system (using SYSGEN) on an illegal copy of the NewWord disk, NewWord should explode in his face the first time he tries to run it.

Piracy protection is a nice idea. If the scheme works, then more power to them. Maybe other companies will use it as a means of providing low cost software while still making a profit. We need to see more good software at an affordable price.

There is still truth in that old maxim that "locks only keep honest people honest." If someone wants to steal the software, they are going to do it. RMS has succeeded in making it tougher and riskier. (They also claim that no one has broken the codes yet. Can you believe it?)

Can they sell enough copies of NewWord to make money while maintaining the $250 price? (If they don't make money, they won't be around to tell about it.) Will users of dubious repute pass around unlocked copies to all their friends? Will the space age pirates be pushed off the gang plank? Only experience will unveil the mystery.

Installation

NewWord is relatively simple to install. The process is entirely menu driven (if your system is already on their list). My own initial installation took about 20 minutes and included numerous trips to the manual to verify potential effects of changes.

If ordered for a particular computer, terminal and printer (e.g., I ordered mine specifically for a vintage Kaypro II), then NewWord is simpler to install. My version of NewWord arrived with the terminal attributes (for a KayPro II computer) installed by RMS. To tailor it for a terminal not on their list, you have to key in a lengthy list of video attributes.

If your printer is one of the 12 or so listed in the installation menu, then NewWord is a snap to install. Simply push a button and you're done. I configured my Prowriter dot matrix printer this way and can use all three primary type faces (pica, elite, compressed) without extra work.

The installation programs for both WordStar and NewWord allow you to set up various parameters. You can set line spacing, page dimensions, margins, even toggle on or off the automatic ".BAK" files. The whole idea is to automate and speed up redundant tasks.

For instance, if you write lots of letters (and very little else), you would set up a disk with your correspondence parameters designed to fit your stationery. However, if you find yourself altering a lot of parameters for specific purposes, then you should set up a disk

If you are not able to print exactly what you want, it really doesn't matter how easy the editing is. Without good printing capability, any word processing tool is worthless. NewWord does printing right.

for each specific purpose.

There is an item in the "NewWord Nuts & Bolts" section of the manual that both bothers and delights me. On page 5-5 we are told that we can install custom printer drivers to take advantage of special features (which ones?) in our printers. The manual needs to give us more information about this.

The real thrill (and bother) comes when you discover that you have to know assembly language to add those niceties. They never really say, but how hard would it be to install a Gemini (not on the list)? Does this mean hiring a programmer or would buying a new printer be cheaper? A little more clarification of this point is in order.

I understand that you can patch in a few things via DDT or SID (you can also do much of this via the "Custom Patches" segment of the installation program) by looking at the "User Area Listings" in Appendix C. But that won't help my friend with the Gemini.

There is normally no need for you to use DDT. There are safeguards so you can verify each item you change. If, however, your installation is peculiar, you will need the hexadecimal codes to control your printer. Sketchy instructions for this process are found in the "User Area Listings" at the end of the manual.

Editing

Editing with NewWord is very much like editing with WordStar. Cursor commands are the same. Block commands are almost the same. Help menus (displayed by Control-J) and four help levels are available. There is a status line and a ruler line at the top of the screen. The opening menu is much the same as your old favorite, WordStar. Settle down and get comfortable.

I won't dwell on all the similarities, because I think it is more useful to show some of the differences. A number of these changes are indeed nice. For those familiar with Issue #6 of *User's Guide* (back issues are available), I'll follow the same format as my WordStar/Perfect Writer comparison.

Formatting For Printing

WordStar and NewWord are quite similar. Everything is done on-screen. There is an optional method that allows NewWord to reformat as necessary during merge-printing (using the dot command `.PF ON`) just as with WordStar.

Though I have not done any benchmark testing, I suspect that NewWord has some advantage in printing speed. When I did my church bulletins for Easter Sunday, the computer shipped 20 pages to my trusty Spool Z-Q buffer in the time the printer printed two pages. The merge-printing feature is fast and involves many disk accesses. This seems to indicate that they have used more efficient code to write the software.

Cursor Movement

The cursor arrows on my Kaypro actually work like they are supposed to. One annoyance is common to both NewWord and WordStar, though. When I use double spacing on-screen, the cursor always goes to the left margin when I move up or down a line. Much "cursoring" could be eliminated if the cursor's column position stayed the same when you move through a double spaced file.

RMS has added a nice scrolling function. You can now scroll to a particular page with a simple Control-QP (Wordstar uses this command for "return cursor to previous position," such as after a save operation). You are asked to enter the page number you want and a carriage return. Your cursor will be displayed somewhere on that page. No matter which direction the machine must search, it will find the page you want.

Moving/Deleting Text

This is much the same as WordStar with one very notable exception: NewWord as a delete-recovery command. NewWord uses the Control-U command to allow recovery of accidentally deleted material. This is the first NewWord command they teach you in the manual. They really make a big deal of it, referring to it constantly. WordStar won't recover accidentally erased text.

Control-U is also the universal escape route. If you goof, you can sometimes back out gracefully this way. With Wordstar, you are committed for better or worse as soon as you give a command. NewWord has a heart for those of us who mess up royally.

Control-U may also be used as an alternate way to move text if your memory buffer is large enough. This technique is familiar to us poor souls who have depended on Perfect Writer for so long. Perfect uses the Control-Y, or yank-back function to recall erased text. It works, though it is not the recommended method in NewWord.

There is a problem (easily solved) in that the memory cache provided has a capacity of only 100 characters. When I make a mistake, 100 characters won't begin to touch it. You should consider changing this buffer size, a task requiring only 6 or 8 keystrokes in the installation program. I set mine for 1500 characters. One thing you must remember is this: If you allocate a larger memory cache, your TPA will be smaller, leaving less room to manipulate documents in memory.

Multiple Documents

We're still out of luck here. NewWord will only allow you to have one document in memory at a time. This handicaps me on many projects. For instance, by the time you read this, I may be writing a set of interactive teaching scripts for a new computer. These will combine two or three sets of material that must be seen simultaneously in order to make sense. I know of only two ways to deal with this; use two computers, switching back and forth, or use our old friend Perfect Writer.

Like WordStar, NewWord will allow you to read another document into your text with the Control-`KR` command. You must read in the whole document rather than isolating the segments you want to copy. As it stands, you still must insert the entire document, then go through and erase the excess baggage — that can be time consuming, but it does work. It is a downright bothersome process if you must exorcise a small segment from a large file for use in the middle of another one.

Another way to include other files in your work is at print time (again, in their entirety only) with the dot command `.FI` (insert file) and the `M`erge-printing option from the opening menu. This command can be used to chain or nest several documents together to, for example, build a custom form letter by choosing from a whole set of boilerplate paragraphs. NewWord can reformat these as needed at print time by adding the dot command `.PF` (print formatting).

By the way, you don't have to purchase a "mail-merging" program at extra cost; it's already there. The commands are essentially the same ones that WordStar's optional MailMerge uses, so there is little new material to learn. An added bonus is that there is no extra overlay file to clog your disk. The code is contained in the printing overlay. This leaves you room on the program disk to store some preset parameter files that you use often.

File Size

This one is still a little spooky. The manual never quite says what the limits are, but there seem to be subtle hints (the hints in the WordStar manual are not so subtle) that you could have problems manipulating large files.

This article (once about 45K bytes long and growing) was no problem. If there is a problem with a piece of text this size or larger, I will have to use another writing tool. I do not like to have text scattered all over the disk under several different file names. I want to store one article (or chapter of a book) in *one* disk file. Doing it otherwise requires extra mental gymnastics to keep everything straight.

I am somewhat reassured by information from one RMS technician who said she had manipulated a disk file one megabyte in size. The scrolling and saving to disk operations were slow, but they worked (everything survived). She said it was supposed to be able to handle up to 4 megabytes at a time. Disk space is your real limitation.

Saving Your Files

NewWord is nice about this. When you execute the Control-`KS` command, the cursor stays put in the document no matter where you are. This means that you do not have to hunt your place because it went tripping back to the beginning of the file. You may find WordStar's method of automatically yanking the cursor back to the beginning of file a major annoyance. NewWord requires no extra commands to take you back to the cursor position you were at before you saved the file to disk, and uses the Control-`KP` command for scrolling to a particular page.

File saving seemed a little slow, even for a 45K file. I suspect it has to do with how NewWord uses 2 or 3 temporary files as virtual memory. This technique (does anyone know a better way?) also eats up disk space, allowing you to edit only those files that are less than 1/3 the size of the capacity of one disk.

Documentation

The manual is generally good. I did find a place or two where descriptions were "fuzzy," but overall, it seems very useable. A beginner should be able to learn the program without too much trouble using the well-organized manual which takes you from rank beginner status to accomplished user in a step-by-step manner. Manuals like this are rare in this business.

The manual is in three parts, each approaching the teaching task from a different direction. The first major section is the tutorial mentioned above. Next, there is a reference section designed like an encyclopedia. If you know what you are looking for, this is the quickest place to find it. Last, there is a large section of appendices. These are helpful for custom installations.

As I mentioned earlier, NewWord is almost as easy to install as Wordstar and a little more versatile. The only exception to this ease is that you must unlock the program disk, a task that can only be accomplished during business hours.

The documentation on the installation could be improved. Users need a little more explanation of what happens when you change something with the installation program.

I appreciate the touches of humor that crept in, perhaps to the editor's chagrin. For example, in introducing the fact that the Merge-printing feature has a nice way to rattle off form letters, they say "Now that you have NewWord, you can misspell the names of thousands of innocent people, too."

One item particularly out of step is the comment on page 11-6 that implies that you must always end your documents with a carriage return. Why was this information hidden way over in an advanced section near the end of the tutorials rather than near the beginning where it should be? Or, did I just miss it the first time? If you don't end the document with a Return, NewWord will not number or footer the last page. This can look strange on your most important letter to the boss.

Perhaps the weakest link in the manual is the binding. Mine is already falling apart — without heavy use. Bound like an ordinary paperback book, the glue is not holding the pages in very well. By the time you read this, my manual should be in a cardboard box.

Product Support

NewWord and Rocky Mountain Software are confirmed winners on this one. They stress in their advertising and sales literature enclosed with the software that you can call them any time (during business hours). When they answer the phone, they sound glad that you called. The technician usually knows the answer right away and is helpful.

Just to check it out, I tried some difficult questions without telling the technician I was reviewing the package. For instance, I asked her how to move a paragraph from one document to another. I also asked her how to store a series of preset parameters (a set of commands used to set up letterhead, correspondence, manuscripts, articles, etc.) in one file, then read over the desired segment to another file to begin writing.

Both these things can be done, using a series of keystrokes. For short and simple tasks, the storage and moving operations can be more trouble than they are worth. Nonetheless, RMS was quite helpful on these points.

I found out that this telephone support is one way they attempt to gain better contact with their customers. Some software companies want you to buy the product and disappear. I'm glad to see a little more friendliness in this business. The machine can be too cold. It is nice to have a helpful person on the line when you need help.

Screen Handling

My Kaypro version of CP/M does strange things with the screen that slow me down when typing. When it is time to advance to the next line, NewWord must re-write almost the entire screen character by character. Recently I wrote a long (10K) single spaced letter. Each time I finished a line, it seemed like I had to stop and let the cursor catch up. By then, I was half way through the next line and the cursor was still dancing all over the screen.

This can be anathema to a speed typist, especially when you are trying to make an insertion into the middle of a document. Imagine being on the freeway trying to go 60+ mph in the left lanes. Now picture yourself stuck in heavy traffic behind some turkey doing 45. He won't move over and you feel a case of homicide coming on. This is what it feels like.

I recognize that this may be a hardware-dependent function. It may have something to do with the way my older Kaypro handles the screen memory and refreshing. Your PCs and compatibles may or may not have this problem depending on how they may handle the screen.

Printing

The printer driver they installed for my Prowriter is one of the best I have used. Boldfacing is done with the printer's own boldfacing command, allowing faster and more efficient printing (none of this monkey business of printing over the same line six times). The super-scripts and sub-scripts are coded to roll the platen up or down a half line as needed, placing them in 4the correct locations without extra blank lines. Overprinting and strikeout works nicely.

All this is very important. After all, if you are not able to print exactly what you want, it really doesn't matter how easy the editing is. Without good printing capability, any word processing tool is worthless. NewWord does printing right.

The Beginner's Report

As I mentioned earlier, NewWord was also tested by a friend who learned how to write his term papers with NewWord.

He was used to doing them with Perfect Writer — and doing fairly well. His biggest problems were footnoting and print formatting (trying to figure out what the document would look like when it was printed).

Perfect Writer's style of footnote cannot be easily altered. Because that style does not match the *Turrabian* style manual the school requires, my friend lost points on many papers.

Since Perfect Writer offers no reliable way to judge the length of a document before printing, it was a guessing game to determine if the paper would be the right length. For instance, some professors told him "Don't write more than six pages."

Because I wanted to test NewWord to find out how easily a comparative beginner could learn it, I let him depend on RMS for support the first month. This tested the product support from the view of a relative novice (my friend does not want to learn all about computers; he wants a writing tool and little else). RMS helped him get going just fine.

NewWord is radically different from Perfect Writer in many ways. The command structure and approach to printing are not even remotely similar, so my friend learned how to write all over from the bottom up. This called for re-thinking all his previously learned concepts.

By having him report back periodically, I found that he had few problems making the transition. The further he advanced into NewWord, the more he liked it.

Aside from having to relearn most of the concepts associated with word processing, things seem to be going smoothly. At this writing, he is cranking out several papers due at the end of the semester. He had to learn how to manually enter the footnotes and alter the page offset, dot commands, and other new (to him) techniques for designing pages.

The only serious problem he noted was a tendency to lose words or whole lines at the end of a document once in a while. I haven't figured this one out yet.

Mine sometimes does funny stuff at the end of a document especially after 2 a.m...

I was so intrigued with the idea of producing term papers with the computer that a complete tutorial is in the works. Watch for it in a future issue of *User's Guide.* With my friend's help, I'll show you how to use NewWord and several other utilities I am rounding up to produce correctly formatted term papers easily with your computer.

Improvements We'd Like To See

NewWord offers some improvements and extra features that WordStar doesn't. At the same time, you do not have to learn a completely new system in order to change over. Most of what you would already know as a WordStar user can be transferred over.

In looking further, as a writer, I noticed several other things that would be helpful. I hope that RMS will give some of this serious consideration as they plan future enhancements. (Even as I was writing this article, several new enhancements were made to NewWord.) A list of functions I would like to see follows.

Flush Right. Consider the concept of header, footer, greeting, and salutation placement. Where on the line do you want them? Are you always satisfied to either place them flush left or to center them? I would like a command to move a heading to the flush right position. There are times when that really looks sharp. How about enhancing the Control- PK command that is used with header and footer lines so it will automatically provide true flush right as well as flush left with the alternate headers and footers?

Proportional Printing. I like proportional printing. On my dot matrix printer, this is the nicest font, with seraphs on the letters. It looks classier than the plain block letters used by the incremental fonts. Another plus is that I can get about 20% more on a page; that would be very helpful since I get long winded on some of my correspondence.

This would require additional sophisticated printer drivers, but it can be done. RMS sells a package that offers just such an enhancement for WordStar. It would be nice if they could offer it for NewWord.

Transpositions. When typing, I tend to transpose letters faster and more often than poor Jack can jump over the candle stick. What is missing is a command allowing me to transpose them back where they belong. I also need to be able to transpose words with a single command.

Now, for either operation, you must toggle off the insert mode and retype or delete the word, move the cursor to the right spot, and retrieve it with Control-U. All this is a bit clumsy — unless you are so used to doing it that you think there couldn't be a better way.

Moving Text. As I mentioned above, it would be most helpful if we could move portions of text more easily from one document to another. Folks, I think I'm spoiled by Perfect Writer on this point. When doing a book (or even a long article), it really would be good to have this convenience.

Conclusion

NewWord is a good investment for the serious writer. It does indeed conquer some of the annoyances inherent to WordStar. NewWord offers more flexibility and power. It is easy to learn and it is adaptable.

If you are considering your first word processing tool or considering a change, I encourage you to test NewWord to see if it meets your needs.

Check it out by trying it if you can; you just might want to buy it. This review should serve as a handy guide so you can compare your needs with what NewWord can deliver. Look it over and determine for yourself if it is what you need.

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Thomas Bonoma, *Microcomputing*
Dec. '83, p 22

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Jerry Pournelle, *Byte Magazine*
April '83, p 234

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When Does User-Friendly Become User-Useless?

The current craze for *user friendly* computers and software gives rise to some questions for thinking people to lose sleep over. Is it possible to make a product so user friendly that it becomes useless? How much control can you afford to give to a silly machine in your efforts to make it user friendly (UF)? I suppose all this leads up to a 1984-type question — is Big Brother about to take over? Think about it!

Welcome to the "User Forum." This is your opportunity to speak out on current issues or questions. This forum is your opportunity to reflect on trends, problems, and ideas that determine where the booming computer and software industry is going. Write and tell us what is on your mind.

Each issue will present a short essay that will offer both sides of a question in an open-ended fashion that we hope will be thought provoking. We hope you will form your own conclusions.

Excerpts from your letters will be printed as the "reply side" of the forum. Be sure to address your letters to "User Forum" unless they are letters to the editor (Letters Editor). If responding to a forum piece, be sure to include the title of the piece you are responding to. Send your replies to:

User Forum
P.O. Box 5245
Redwood City, CA 94063

by Thomas Howe

Revolutionizing Computers

I appreciate this trend toward UF. After all, who wants to spend endless hours pecking away at toggle switches entering binary code into volatile memory — all in the name of programming? Most people don't want to be programmers anyway.

Likewise, who wants to mess with a computer the size of a warehouse? It's kind of nice to have a computer you can carry instead of one that has to be professionally moved. Computers, you've come a long way.

Computers have improved to such a degree that the average Joe and Jane can sit down and operate one proficiently within a matter of hours. Computers today are enhanced by function keys, better software, better keyboards, disk drives, mice, more powerful operating systems and faster chips. A computer is much simpler to run than it used to be (remember the mountains of punch cards in days gone by?). I hope UF is here to stay.

Greater public awareness is also a factor. People know more about computers now than they did 10 years ago. Once upon a time (about 30 years ago) computers were reserved for the large corporations and universities who could afford them and who had the highly trained scientists to run them.

Now, anybody can buy an Atari, Commodore, etc. and take it home to the kids. I have a friend whose 4 year old son is writing simple programs. The kid taught himself! That is what UF is all about. The boy took to the computer like a duck takes to water.

The computer is not the intimidating monster it used to be. It is chic (here in Marin County, CA) to have a computer at work and at home. Computers are getting downright chummy. They are used to perform marriage ceremonies, find you a computer-matched date, and it's surprising no one tries to take one on a date!

What Are We Giving Up?

The craze for UF computers has driven both hardware and software manufacturers to extremes as they try to make the computer more UF. Some of these gimmicks are nice; others sap the power of the machine and devour memory.

Menus are used everywhere. You do most of your hardware installation via menus. Simply pick the option that fits you. If the printer (or terminal) you own is not listed in the menu and there is no option for custom installation, how far up which creek are you? Flexibility is often left out in the name of UF.

Some systems advertise over a million colors. You could paint ten thousand rainbows without a single duplication. What in the name of UF is that worth if you have a black and white printer? Seems like they made installation more complicated — choose your colors before you use the product.

Some software comes with a preset

array of formats. Just pick one and go. In word processing (the field I know best), this can be kind of nice. It can also be limiting.

For instance, Perfect Writer® (Perfect Software) does footnotes. To the uncritical eye, it does them just fine. In the world of academia, my buddies in seminary discovered that the dashed line separating footnotes from text is the wrong length (according to the *Turrabian* style manual). There is no easy way to alter this parameter. That ain't UF! That's useless.

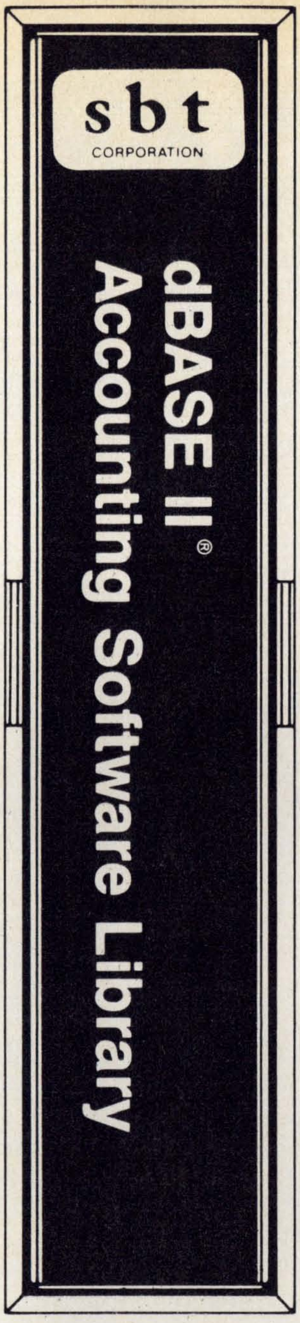
The trend toward writing many programs in BASIC rather than using machine code is another sign of UF. Software written in BASIC is easier and cheaper to modify to run on totally different machines. How else do you think Apples can get along with Big Blue?

Some of this software written in BASIC brings with it a severe case of Altzheimer's disease. Your memory is eaten up by a program that could have been coded more efficiently in C or a similar language. This is being developer friendly. They don't have to work quite as hard.

Others have so chopped into their command structures that there are few choices. It is UF because you really do not have to know anything to run it. Of course, it won't do much either. There is one format for correspondence, one for reports, one for recipes, and so on. That is just fine until you absolutely must have something different.

Spellbinder® (a word processing program from Lexisoft) is an example of UF. Eleven pages of fine print in the manual gives a synopsis of commands, then you are told a separate manual is available to instruct you in writing macro commands of your own. It takes time to learn to write your own commands, but then you can make the program more UF.

Has the computer industry defined it's audience? Are they building computers for idiots (or are we idiots for pushing them this way)? Is there a mid-point of optimum efficiency where the computer does all it can and then requests human intervention?



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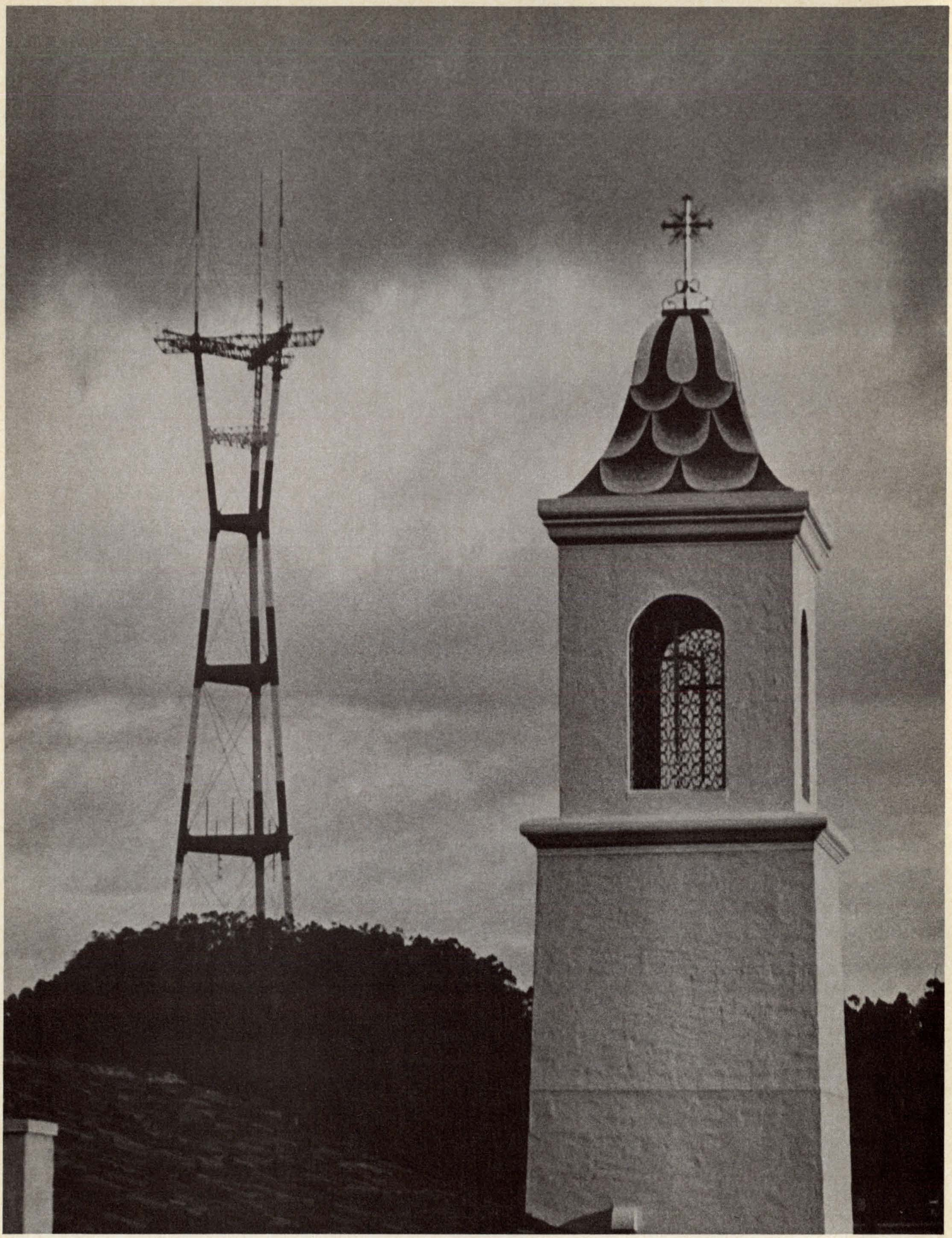

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Bible Study By Computer: THE WORD Processor

The entire King James Version condensed to fit on floppy disks, ready for concordance-type searching and research.

by Thomas Howe

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The Bible is the primary rule of faith for Christians, both in America and abroad. More work and research has gone into its study than any other book in the world. This work goes on in earnest and is becoming increasingly sophisticated.

As a Southern Baptist pastor, I have a deep love for the Bible because it is *The* Book that tells about God. I spend much time working with it, trying to learn and understand more about my relationship to God. I then share these insights with my congregation. This can be time consuming work.

Typesetting Conventions

Throughout this article we use *THIS typeface* to show exactly what you should type at your keyboard, with the special symbols ↑ for the Control key (CTRL, CNTL or ALT on some keyboards), and ↵ for the Return key (RET, CR or Carriage Return on some keyboards). We also use This Typeface to show messages displayed by the system or by programs.

I am also quite sensitive to anything which would distort what God seems to be trying to say through the Scriptures. Because of this, I am warily cautious whenever anyone comes up with a new way to study the Bible. The rise of cults with their own peculiar ways of interpreting the Bible makes me even more wary.

Many tools have been devised to make Bible study easier. Among these are Bible dictionaries, concordances (books that list every occurrence of every word in the Bible), and commentaries. All these tools are good and proven by the tests of time and usage. They have one major drawback: bulk.

What Have We Here?

Bible Research Systems of Austin Texas has taken a major step toward bringing Bible study into the 21st century. They have reduced the bulk of the Bible's text onto as few as six five-inch floppy disks. It fits on four eight-inch disks.

You may order it directly for $199.95. A substantial topical index is also available for $49.95. THE WORD Processor uses the familiar King James text as its starting point. This text is compressed very tightly to get it onto six disks for the Kaypro II (eight disks for the Apple). According to reports, the programmers devised their own compression system rather than relying on existing schemes.

By various means such as substituting specific symbols for common words, the 4.5 million characters in the KJV have been condensed enough that you do not need a truck to transport all the disks. For instance, the gospel of John is stored in eight disk files for a total of 48 kilobytes.

You will not be able to read this text without a means to decode it. THE

WORD Processor deciphers the compressed text and displays it on the screen or sends it to your printer.

They have reduced the mass of a concordance to 99K of software that will produce a custom listing of references according to your own personal needs. A topical Bible is not needed as you can create your own according to your needs. We now have access to the electronic Bible — and it is still the same WORD we have been used to for centuries.

The word study approach is a basic and important tool in understanding the Bible. This technique calls for searching out the many places where a given word occurs in the Bible. You then compare these references and look for similarities and differences. You also study how the words are used in each instance to gain insight into what they meant when they were originally written.

This software will search the specified text for any word or combination of words you want to find. This is particularly useful if you remember a short phrase of Scripture from a sermon or Sunday School lesson, but cannot remember the whole verse. You can use this tool to look it up much as you would use a concordance.

You can create your own indices which are stored on disk for later recall. These indices can be customized and modified at will. You can merge them, even to the point of using this as a technique to determine which verses contain an important combination of key words.

Another bonus is included here. You can print out each of the selected references, constructing your own customized "topical Bible." If you alter the control sequences (easily accomplished), you can have them printed with wide margins for note taking.

How Does It Work?

The software is relatively easy for even a computer novice to set up and use. Computer knowledge is not required. The user needs to know only how to copy his disks (for back up purposes) and how to copy SUBMIT.COM onto the program disk if he uses a CP/M system.

I have a friend with almost no knowledge of computers. I simply handed him the disk and told him how to turn the machine on. With the manual in hand, he was successful from then on.

The software appears to have been partially written in CBASIC or something similar (evidenced by the run time interpreter CRUN v2.08 from Compiler Systems Inc.). The CP/M version is written to be started by use of SUBMIT.COM and a batch of submit files.

There is a ".COM" file on the program disk called SCAN2.COM. I used DDT to look into it and found that it is almost all nulls (zeros in computer code). Though I am not skilled in deciphering assembly language, I suspect that this 40K file works as a virtual memory cache — an area for temporary storage of data. Checking the submit command files, I found that SCAN2.COM is always loaded before any other portions of the software or text.

THE WORD Processor has been adapted from its original Apple format to run on the IBM PC and compatibles, any Z80 based CP/M computer, and certain TRS-80 models. (This is a further clue to its origins in BASIC — it is transportable to a variety of machines, many of which have BASIC built in.)

How About An Automatic Manual?

Most of the documentation is good (there are some exceptions). You are led step by step from the time you turn the machine on until you are constructing your own topical data bases of Scripture references. The manual shows you exactly what to expect on the screen and does a good job of describing each step of every operation.

Appendix A is an absolute essential. THE WORD Processor uses a set of three letter abbreviations for the names of the books of the Bible. For example, "AMO" is used for Amos and "1TH" stands for The First Letter of Paul to the Thessalonians. You must use these when searching for any reference. Though the manual does not say so, it is advisable to photocopy this page and put it on your wall above the computer.

There is one major deficiency in the documentation. I wish there was a section with actual case studies showing how the software can be applied. They suggest several uses, but do not demonstrate them. I would like to see examples of how to use this software in personal Bible study, sermon preparation, and preparation for a sunday school lesson.

This could be done in terms of "This is how I did it." Lacking the complete text of the Bible on the demo copy, I am unable at this point to devise such examples to show you here. (Companies that provide demo disks that are less than complete make it difficult for anyone to give them fair reviews.)

Another minor problem is that the manual does not tell you to enter the commands and Biblical references with capital letters. Entering a reference with a lower case letter will cause an error message. I got around this problem by setting the cap lock.

Using THE WORD Processor

Using THE WORD Processor on the Kaypro II is a simple process. Assuming that you have made your copies of the disks and completed the initial configuration process (easily done), you simply insert your program disk in drive A and the text disk in drive B. Then type *SUBMIT TWP*↵. In a few seconds, everything is loaded and ready to run.

The main menu appears, which is the hub of the whole operation. There are eleven options. You select one by pressing the highlighted letter beside the one of your choice.

The first thing you have to do is select the range of your study. Using the RANGE option, you enter the beginning and end of the segment of Biblical text you wish to study. For instance, you may enter *JOH 1:1* as the beginning of your range. Then, to limit the study to the Prologue to John's Gospel, you would enter *JOH 1:18* as the end of the range. This "fences" the text and allows you to specify the specific portion of Scripture you want to study.

You can then display your text on the screen by selecting the TEXT DISPLAY OR SCAN option. This can be scrolled up or down as needed to read it. If you wish to print it you can return to the main menu and turn on the print mode. When this is done, the entire text in the selected range will be shipped out to the printer.

You can scan the text to see how many times and where any given word or phrase appears. You can select several words or phrases for simultaneous searching. These can be indexed and retained for later use.

Devise your own index with the CREATE AN INDEX option of the main menu. Suppose you want to know where "WORD" appears in this Prologue. You will be creating a new file on the disk, so name the index according to the file naming conventions of your system. Call this one WORD.NDX. The new file can contain hundreds of entries if need be. The system can do the scanning automatically if you wish.

You are now ready to enter the words or phrases to be indexed. This works like the Scan option in that it will find every place the chosen words appear. (You can also locate every place that your chosen word appears as part of another word.)

The index is created and stored in the file you named. You can then look at it either as a simple list of references or you can view it in context on the screen. Furthermore, you can print the index in either form if you choose.

You can modify the index to reflect your own preferences as needed. Delete anything you consider irrelevant to your study. Add other references outside your chosen range as you like; these will be automatically inserted in the list in the correct order they would appear in a printed Bible.

You can combine this index with another index, perhaps to locate every place that "WORD" appears in the same verse as "GOD." This produces a more selective index.

When you want to return to the main menu or to halt a function in progress, use the asterisk key or the ESCape key. End the program from the main menu with the QUIT option.

Design Wishes

The software seems to do what it claims in the advertisements. However, I see this as a first generation Bible processor. There is room for more sophistication as microcomputers become cheaper and more powerful. Presently, the computer is only able to do its searches from a simple standpoint. In-depth Bible study involves the comparison of ideas and thoughts as well as detailed word studies.

I would like to be able to set several books of the Bible side by side for study. I envision being able to set The Gospel According To John along side Revelation and looking for key words that are common to both in large numbers. This would be an indicator of what was foremost on John's mind or of how John's perspective may have changed in the years that intervened between the writing of each letter. The computer could speed along on a study like this.

As mentioned above, I would add several extra tutorials to the manual — if I could.

I hope that sometime in the near future Bible Research Associates will construct versions of this software to handle some of the more popular new translations of the Bible. Since I use the New International Bible, I would love to have it computerized. The New American Standard Bible is another popular choice.

The text is presented on the screen and on paper in all upper case characters. I realize it would mean re-typing the original unsqueezed text and possibly using a little more sophisticated squeezing system to accommodate the change, but it would be much more pleasing to see lower case letters where they belong. If I could...

A superb enhancement would be to make it possible to store selected texts in a regular ASCII file on disk for later use by conventional writing tools like Wordstar or PeachText. It would be very handy to be able to merge these texts into other written work. Because I am both a pastor and a writer, I would consider this a valuable addition.

A Final Comment

THE WORD Processor is a nice addition to the field of Bible study. I welcome this entry into the work.

If you have access to a hard disk, you should be able to scan a large segment of Scripture easily and quickly. Using floppies, I suspect that it would be a little more time consuming, but still worthwhile. I wish I could try it on a hard disk and report optimum performance, particularly with parts of my wish list above.

For my own personal study, I can still use a *Strong's Concordance* more quickly than I can set up the computer. However, I think this will change as the computers and software become more powerful. Within a few years, we should be able to perform more sophisticated textual analysis than ever before. This will be good as the machines can take over more of the mundane sorting and classification tasks, freeing our minds to analyze the information.

Many people will find this current approach to the electronic Bible helpful because they can compose their own personal reference lists. Bible study is most meaningful when you can do it yourself and then own the results. THE WORD Processor is a tool that should make this easier. I can see that it has the potential to make life easier for many Sunday School teachers and scholars alike.

Many believers today fear that the computer is a tool of the Devil. Perhaps this software will help dispel that notion by making Bible study easier and more efficient. With this in hand, we can view the computer as a tool we use to make our understanding of God clearer. This is acceptable. □

THE WORD Processor
Bible Research Systems
9415 Burnet Road, #208
Austin, Texas 78758
(512) 835-7981

The Sleaze Patrol

Adventures in the land of double-dealing duplicity, epic sagas of the fight against mendacious mountebanks and bamboozlers by that protector of Truth, Justice and the American Way — The Sleaze Patrol!

I don't know if I get ripped off more than other people or if I just mind it more, but one way or the other, I'm almost always hassling with someone or other who has:

a) lied to me about what a product would do;

b) sold me a product that doesn't work the way it's supposed to; or

3) sold me a product that doesn't work at all.

Whether it's a), b) or c), this joker is usually trying to convince me that it's somehow all my fault.

Now woe be unto him (or her, I suppose, but it's usually him) who tries to do this to me. Hell hath no fury like Naiman rooked, and I can, when it's required of me, display a telephone personality midway between that of Adolf Hitler after the Battle of Stalingrad and a female grizzly bear whose cub you've just skewered and are now roasting over the fire for dinner.

Although awesome, like thunderstorms or earthquakes, my phone conversations seldom do the trick, usually because the wires melt before the person on the other side can respond (sometimes the receiver explodes first). But no matter: I also write one hell of a complaint letter, and I know who to send it to. And, as long as it's on the

---

by Arthur Naiman

Copyright © 1984 by Arthur Naiman. The views expressed in this article are the author's views, not the publisher's views. The Sleaze Patrol was dreamed up entirely by Arthur Naiman.

Arthur Naiman lives near Berkeley CA (Kensington) and has seen his share of sleaze. He says, "Here's the first Sleaze Patrol column. I'm really happy with it and I hope you like it too. Don't change a word or even a punctuation symbol." We didn't, but we feel compelled to tell you who this guy is.

Here's a paragraph from his two-page resume:

"I've traveled widely and speak execrable French. I've done standup comedy, led whitewater raft trips, manufactured the original LBJ dartboards, driven a cab, been a photographer and an abstract-expressionist painter, sold shoes in a store and socks door-to-door, dubbed foreign films into English, worked in a printing plant, and taught biology to wayward girls in a convent in Valhalla (NY)."

You may know him as the author of several computer books and of *Every Goy's Guide to Common Jewish Expressions* (Houghton Mifflin). His most recent book is *Introduction to the Lisa* (Addison-Wesley), though most computer users would know him as the author of *Introduction to WordStar*(Sybex).

We communicate by telephone only, though he promised he'd meet us at the next computer show — "I'm a 400-lb. albino with purple and green spiked hair. I'll wear a wet suit so you can recognize me."

computer, I usually find a dozen or so other agencies I think might be interested.

If that doesn't work, I know how to go to court too. In New York, I won a small claims case against two — count 'em, two — lawyers for Pan American Airlines. And once, while fighting (and beating) a more-than-usually stupid ticket in Berkeley, I cross-examined the issuing officer with such panache that the DA came up to me after the verdict and said, "Where did you *learn* to *question* like that?"

I'm as proud of these abilities of mine as a good cancer surgeon is of his (and I see our activities as quite similar). But if I gave every sleazeball who rips me off the treatment just described, I'd never have time to do anything else with my life. Even if I got my money back every time, these guys would just go out and do it again to some other poor shnook (not that I could stand to let them get away with it if I were the last shnook on earth).

This column is my solution to the dilemma. By telling other people how I've been ripped off, I can make the time I invest worthwhile. Like the immune system, which maintains constant surveillance for scuz that's invading your body (and eats it for breakfast when it finds it), I'll use Sleaze Patrol to expose to the searing light of day those who seek to dishonor and debase our beloved microcomputer community.

Such a service is long overdue but — for some reason — computer magazines with hundreds of pages of ads have shied away from providing it. Tony Bove and Cheryl Rhodes deserve your thanks (and the Nobel Peace Prize) for having the guts to do what other publishers won't.

Although you can be sure I'll tell you about every time I get gypped, that won't happen frequently enough to fill the column (I hope!). So I need your help. Send your sad tales of commercial guile and mercantile chicanery to: Arthur Naiman, c/o User's Guide Sleaze Patrol, PO Box 5245, Redwood City, CA 94063. I'll investigate them, and if they seem like Sleaze Patrol material, you'll see them here, written up in my inimitable breezy style.

But you won't see them until after I finish the two books I'm writing. So there won't be a Sleaze Patrol in the next issue or the one after that, and then I'll be back.

Since none of you was psychic enough to write to me *before* this first column, I'll have to rely on my own experiences. Here's a recent one:

After all the years I've spent around computers, I should have known better. The name alone should have tipped me off — Chicken Technology. How could a company name itself, even whimsically, after the stupidest, most vicious animal on earth? (There are dumber animals — I guess — and a few that are more malevolent, but on a combined point score, even human beings can't compare to chickens.)

They were selling a program called Pay Less Tax II from a booth at the West Coast Computer Faire. The brochure said that it would run on my computer, that it was written by a CPA and ex-IRS agent, and that it came "complete." Best of all, it only cost $120. In other words, it sounded great.

Since I was going on vacation about a week before the tax deadline, my main concern was how soon they could get it to me. "Hey, no problem, you'll have it in three or four days." After making them repeat that a couple of times, I plunked down my money.

Well, sure enough, the program arrived promptly. Meanwhile, my computer went berserk. So I ran around getting it fixed and spent the rest of my time sorting through several billion receipts (I have the most complicated personal tax return in the world). Time was running short, but I wasn't worried — I had this great new tax program that would halve the time I had to spend preparing the forms.

Finally, I finished with the receipts. I used the big forklift to move them out of the way, clasped the Pay Less Tax II package in my sweaty little hands, and tore it open. The third page had me worried for a moment, because it cautioned that "SPECIFIC MODELS REQUIRE CERTAIN SOFTWARE." But when I found "Z-80 BASED MICRO/IBM 3740 FORMAT" (that's me), all it listed was "CP/M." Whew!

I went plowing on through the manual and it was page *17!* before I came across this: "PAY LESS TAX II is written in basic (sic) and therefore will not run unless MBASIC is loaded first."

It was after business hours, so I started preparing my tax returns by hand (I used a pencil, actually; my hands don't have a sharp enough point). The next morning I called Chicken Technology. It wasn't until late afternoon that they called back to say: "Of course the program requires MBASIC. How could you have thought otherwise?" (perhaps it was because their brochure and their salespeople both failed to mention it).

They offered to send me a copy of MBASIC, which they said they could get to me the next day or the day after. But I'd already half-finished my taxes the old-fashioned way. By the time I got MBASIC, there'd be no point in using the tax program.

Now I *could* have driven through rush hour traffic to their office (about a two-hour round trip at that time of day), tried to find a place to park (and either gotten a ticket or paid several bucks at a parking lot), and picked up

When I returned two weeks later, I found the package, which they had sent back unopened, and a letter that for sheer gall, for raw shameless chutzpah, must rival the guy who killed both his parents and then threw himself on the mercy of the court because he was an orphan.

It's like the old joke about the guy whose new car is delivered without any wheels. "Oh, you wanted wheels," the salesman says. "Why didn't you say so?"

the MBASIC disk myself. I even momentarily considered doing that. But then I thought, "Wait a minute. This isn't *my* fault. It's like the old joke about the guy whose new car is delivered without any wheels. 'Oh, you wanted *wheels*,' the salesman says. 'Why didn't you say so?'"

So I asked for my money back. The guy almost sounded genuinely regretful when he said, "I'm sorry, we simply can't do that."

Now you have to understand that people at Chicken Technology aren't greedy, or small-time, or anything like that. It's not that when they get their hands on a really big hunk of money — we're talking about *three figures* here — they're reluctant to let go of it. Personally, the Chicken guys would love to refund my money. If there were any way they could do it, they would.

But there's a gang of thugs standing right there with guns to their heads. The minute a Chicken guy offers to do the right thing, it's curtains for him. And that's not all. The thugs know where all the Chicken guys' kids go to school. One false step and they'll never see their sweet little faces again. So, you see, they really *can't* refund the money.

Even so, I gave them a chance to change their minds. I sent them the program back, with a letter inside the package and return receipt on the outside, and went off on my vacation.

When I returned two weeks later, I found the package, which they had sent back unopened, and a letter that for sheer gall, for raw shameless chutzpah, must rival the guy who killed both his parents and then threw himself on the mercy of the court because he was an orphan.

It begins:

"Dear Mr. Naiman,

"We appreciate your interest in *Pay Less Tax II* [*interest*!!! Can you beat that? I'm about as interested in *Pay Less Tax II* as I am in Nancy Reagan's wardrobe], and your concern that MBASIC is required to use the package." This guy is really a genius at writing provocative, passive-aggressive prose. To say that I'm "concerned" that MBASIC is required to use the package is like saying that Oedipus was "concerned" to learn that his wife was also his mother.

The letter continues:

"For anyone who has purchased this program in the eight-inch CP/M format we make a point to tell our customers that the program is written in BASIC and requires MBASIC to use with CP/M." That's right! Of course. Now it all makes sense. I bought the program *knowing* that it required MBASIC, *knowing* that I don't have MBASIC, and therefore knowing that I couldn't use it. I told them to rush it to me so I couldn't use it sooner.

OK — now get this next paragraph:

"Because of this 'misunderstanding' [in other words, he'll call it a "misunderstanding" to avoid coming right out and saying I made the whole thing up] at the trade show we will make MBASIC available at our expense (upon your request) as we do not take program returns."

Then, perhaps mindful of the fact his letter was dated April 14th, he goes on to say:

"Bear in mind that *Pay Less Tax II* is a *planning* as well as a preparation program that can be used throughout the year." Of course I have the 1983 version, but that's no problem: I can update to the 1984 version for just $65. What a relief! I'm not getting screwed after all.

In order to appreciate the masterpiece of audacity this letter is, notice how, like a piece of balalaika music that keeps getting louder and faster, it grows more and more outrageous as it moves toward its spectacularly brazen conclusion.

I thought "misunderstanding" really took the cake — until I got to this:

"Thanks for your business."

Untoppable? Guess again. He followed it with:

"Sincerely,"

So I'm left with two choices. I can do my whole number — sue Chicken Technology in small claims court, write letters about them to the state and city consumer fraud offices, the postal inspectors, the people who put on the Computer Faire, the magazines where Chicken Technology advertises, and so on — in other words, as Lenny Bruce would put it, I can "do Jose Greco on their face." (Just a figure of speech, you understand; I wouldn't dream of threatening physical violence. I have other ways of achieving my goals. And, anyway, as the saying goes: I don't get mad. I get ulcers.)

I'd end up getting my $120 back, of course, but only by spending far more time than it's worth.

Or I can take the more rational, more mature — not to mention cheaper — approach and simply write the money off. It's just that by this point I'd rather give $120 to Idi Amin than to Chicken Technology.

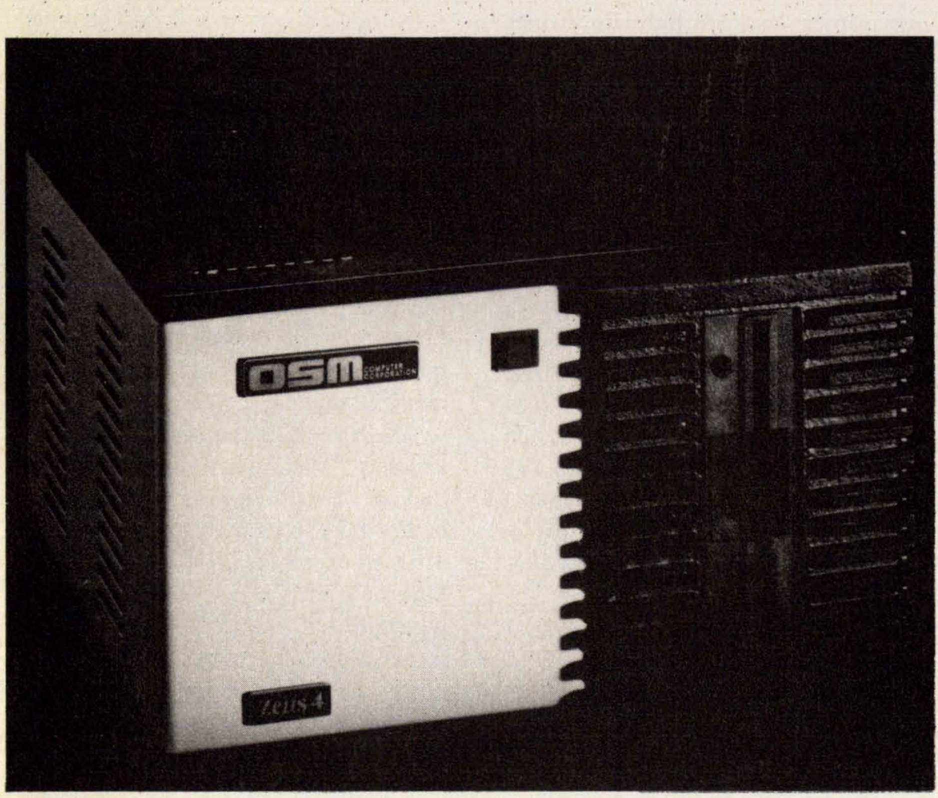
I don't even seem to have learned a lesson from all this. Just a couple of days ago I bought a clock at a going-out-of-business sale. ALL SALES FINAL, NO RETURNS was stamped in big red letters on the receipt. But I figured, "what can possibly go wrong with an electric clock?" And, sure enough, on the back was a little sticker that explained that this was a precision quartz clock and didn't even need an adjustment mechanism. The only problem is, the clock runs an hour slow a day.

Well, campers, that's my horror story for this issue. Surely *you* can do better than that. So send in your cards and letters, and I'll be back in a couple of issues with more adventures in the land of double-dealing duplicity, more epic sagas of the fight against mendacious mountebanks and bamboozlers by that protector of Truth, Justice and the American Way — the Sleaze Patrol!

CP/M-80 •
MP/M-II •

The OSM Zeus 4 Multiple-User Network

Several computers in one box linked in a network configuration that lets multiple users share a hard disk and several printers.



Zeus System

The Zeus 4 from OSM is a local network of microcomputers in a central box. Each user (up to a total of 4) has a dedicated card which contains a 4MHz Z80 microprocessor with 64K memory and serial and parallel communication ports. The master computer interfaces with each user and provides the exchange of data to the hard disk and any other peripheral device hooked into the system.

The Zeus 4 and other Zeus computer systems are from OSM Computer Corp., 655 Clyde Ave., Mountain View, CA 94043.

Zeus 4 is a trademark of OSM Computer Corp. CP/M is a registered trademark and MP/M is a trademark of Digital Research, Inc.

by Tony Bove & Cheryl Rhodes

Zeus, the presiding god of the Greek pantheon, is often depicted hurling angry thunderbolts down on humanity from high atop Mt. Olympus. As with most computer brand names, you have to make a very wide mental leap from this image to an analogy of how this system works. Basically, the Zeus system has one central computer controlling several user-computers so that they can share one hard disk, additional disk drives, and several printers or other serial/parallel devices.

The Zeus 4 can accommodate four users, with a separate Z80 processor board for each user housed in one enclosure that also contains a five-megabyte, ten-megabyte or 15-megabyte hard disk and a 5.25-inch floppy disk drive. You add a terminal for each user (up to four users), and one or more printers, and you have a multiple-user CP/M-compatible system.

In the wake of an influx of local network devices for IBM PC-compatible computers (OSM also has PC-compatible network, the ZeusNet, to be reviewed separately), the Zeus "network-in-a-box" approach seems odd. As it turns out, the approach provides as fast or faster throughput than a typical multi-user eight-bit computer costing one-and-a-half times as much. Also, compare the typical cost of a PC network (around $3500 per user plus hard disk and peripherals) to the cost of the four-user Zeus 4 network ($2200 per user including terminals and a five-megabyte hard disk).

Personal computer networks offer expandability and "stand alone" operation in the event of a network failure, but for applications that require several users to share one hard disk, this "network-in-a-box" is a low-cost alternative.

Hardware

OSM put the equivalent of four distinct computers together with a 5.25-inch floppy drive and a hard disk in one 8-inch by 13-inch by 15-inch box that weighs 24.6 pounds.

The unit is quiet because it has no fan. The main heat source — the power supply — is attached to the outside of the box; however, the entire box gets hot after using it for an hour. The polished wood top serves as an easy-to-remove lid (secured with velcro strips). We recommend that you remove the top when using the computer for periods longer than one hour.

You can choose a five-megabyte, ten-megabyte or fifteen-megabyte hard disk, and a 250-kilobyte or one-megabyte floppy drive (5.25-inch) for your unit. You can also get an optional external eight-inch floppy drive.

We were provided with a five-megabyte hard disk and one megabyte 5.25-inch floppy drive in the box, and one external eight-inch drive. We transferred data files from other systems using the eight-inch single-density disk format, which was read properly by the eight-inch drive supplied by OSM. We could not read Kaypro or Osborne disks in the 5.25-inch drive, so we customized a version of Modem7 to transfer data files through a serial port.

Eight serial ports are provided: a terminal and printer port for each of four users (one user being the master console and master printer). However, not all of these ports have RS-232 connectors. Each user has one connector for a terminal, and there is are two additional connectors: master printer and user printer. You can purchase cables and attach them directly to the user boards to add more serial connectors.

One parallel port is provided for each user, but these ports are not cabled to connectors. We did not test the parallel port. *(In another article describing a bowling center network using the Zeus 2, the writer describes the parallel ports.)*

Each user has a 4MHz Z80 processor and 64K of RAM dedicated to that user's task. A master processor board has a Z80 processor and 64K dedicated to controlling the user processors and providing disk buffering (using memory as a disk cache). The MUSE operating system resides in 24K of the 64K on the master processor board.

The Software System: CP/M-compatible MUSE

We say the system is "CP/M-compatible" because it is not actually CP/M but MUSE (Multi-User System Executive), which provides a CP/M-like system for each user. This is not an MP/M system, nor is it anything like MP/M. At each user terminal, you first see the MUSE sign-on screen, where you pick a "user name" which may or may not have a password associated with it, then you see the CP/M `A>` prompt. You can then theoretically run any CP/M program.

For example, we ran WordStar® (MicroPro Intl.), dBASE II® (Ashton-Tate), SuperCalc® (Sorcim), T/Maker III® (T/Maker Co.), WASH® (Micro Resources), the SBT Accounting Package, and a tailored version of Modem7 (public domain), all on a regular basis without any failures. Using Modem7 we were able to transport data from other CP/M systems to use with these programs.

Our experiments show that four users can run a complex program like WordStar (complex in that it "exercises" the system and uses many of its resources), with performance that is *better for each user* than some single-user CP/M systems. This is because MUSE offers disk buffering and print spooling to speed up CP/M's disk access and printing operations.

You can run a single-user version of real CP/M on the master console of the Zeus 4, but this disables the other users. We have not found a need for it other than to run the public domain BYE program used to set up a system to answer the phone and perform for the caller — such as a computerized bulletin-board system (CBBS) or remote CP/M (RCPM) software exchange system).

MUSE offers password-controlled access to user areas ("user names") and does not provide the CP/M USER command. To change to another user area, you type the `LOGON` command and "log on" with a new user name and password.

We did not set names and passwords at first, and found that we could log into any user area from one to five from a user terminal. From the "master console" terminal we could log into a special user area "32" which is controlled by a system manager password (set to `MANAGER` when your system arrives; you can change it).

From the "system manager" user

area we have direct CP/M-like access to the master printer, the configuration utility to set up user names and passwords, and other system utilities. Included here is the program SHUTDOWN.COM, which performs an orderly shutdown procedure for the hard disk: moving the recording head to an "off" position so that you can move the hard disk without damaging it.

When you type a slash (/) as a command, MUSE puts you in the equivalent of CP/M's user zero. User name 5 (password is also 5) also gives you access to this area. This user area is also the *common* area where common files and programs should reside. A program in this user area can be run from any other user area; a data file can also be used from any user area.

For example, if you are in user area 2 of drive A, you can type the name of a program in user 5, drive A (actually user 0, drive A) to run it. From drive B, you would prefix `A:` to the name.

You can use the common area to store one complete copy of a data base for use by all users in the system. There is no limit to the amount of space in any single user area; the only limitation is in the entire disk space.

MUSE provides an easy-to-use COPY utility for copying files from one user area and drive to another. The BACKUP (hard disk backup utility) and various SYSGEN and FORMAT utilities *can be run only in single-user CP/M mode.* from the master console. This can be an inconvenience when formatting disks, since all users must stop using the computer. Backup of the hard disk make the system un-usable for a period of time depending on the size of your disk.

MUSE provides a file and record locking facility that is compatible with MP/M-II. MUSE also provides communications protocols (XON/XOFF or DTR hardware handshake) to "talk" to most printers through serial ports.

Support & Documentation

We were not impressed with the set of manuals that arrived with the system. Information is hard to find and there is no reasonable tutorial on MUSE. Since MUSE supports features found in the larger and more expensive Zeus 2 and 3x systems, more than once we tried to configure something (such as a serial port) using a utility not supported on the Zeus 4.

As for support, we experienced only a few problems while configuring a serial port for use with two of our printers and our modem. The training specialist helped us through these problems. We soon learned how to change the baud rate of the user printer and how to connect and use the external eight-inch drive.

(See another article in next issue on using the OSM Zeus 2 for a bowling center network, in which the writer describes his experience with OSM's customer support.)

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Dr. Dobb's Journal, Feb 84

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Microsystems, Aug 83

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The Meaning of Concurrency

An overview of the concurrency features of the Concurrent CP/M-86 and MP/M-86 operating systems.

Concurrent CP/M-86
and MP/M-86 Tutorial .... **Page 50**
Concurrent CP/M-86:
on the DEC Rainbow .... **Page 34**
on the IBM PC .... **Page 37**
MP/M-86 on CompuPro .... **Page 48**

Concurrent means "happening at the same time." Under MP/M-86 and Concurrent CP/M-86, your computer can run two or more programs concurrently.

Concurrent CP/M-86 and MP/M-86

Concurrent CP/M-86 and MP/M-86 are operating systems created by Digital Research, Inc. for computers based on the Intel 8086/8088, iAPX 186/188, or iAPX 286/288 microprocessors. Both systems are designed to serve several people at the same time, or do several things at the same time for one person. Concurrent CP/M-86, referred to as CCP/M-86 in this article, also has a "windowing" feature which lets you display the output of two or more programs at once.

The latest version of Concurrent CP/M-86 is called Concurrent DOS. This article covers the earlier Concurrent CP/M-86 (which most people have, since Concurrent DOS is not fully released); a future article will cover the new features of Concurrent DOS.

Typesetting Conventions

In this article we use `THIS typeface` to show exactly what you should type at your keyboard, with the special symbols ^ for the Control key (CTRL, CNTL or ALT on some keyboards), and ↵ for the Return key (RET, CR or Carriage Return on some keyboards). We also use `This Typeface` to show messages displayed by the system or by programs.

Where noted, we use *italics* in reference sections along with `This typeface` to imply something you supply that is optional in the command. In such cases, `lower case in this face` implies something you supply that is required with the command, which is usually in `UPPER CASE`.

by Jonathan Sachs

Jonathan Sachs writes for several magazines. This article was specially adapted from *The Osborne/McGraw-Hill Guide to CP/M-86* by Jonathan Sachs, © 1984 by Osborne/McGraw-Hill, Inc.

Strictly speaking, your computer can do only one thing at a time. At a given instant it may be adding two numbers, or reading a character from a keyboard, or writing a record to a disk; such an operation can serve only one program. But MP/M-86 and CCP/M-86 can switch your computer's attention between tasks quickly enough to give a good imitation of doing two or more things at once.

The most obvious use for concurrency is to let one computer serve several users. For example, if your computer has four *consoles* — four terminals, or four sets of keyboard and display — it can be made to run a different program for the user of each terminal. MP/M-86 and multi-user versions of CCP/M-86 do this.

CCP/M-86 (and, to a limited extent, MP/M-86) can also let you run two or more unrelated programs from the same console. This is also valuable, though its usefulness is not so obvious.

With this kind of concurrency, your computer can perform a task that does not need your attention while you do something else. For example, you can start a program that prints files, and while it runs, you can use a word processor — possibly creating more files to be printed. Or, you can start a program that sends and receives files by telephone while you do something else.

Sometimes you need to do several things concurrently yourself. For example, suppose you are writing a financial report, and you must refer to the financial data you are writing about. By running a data retrieval program and a word processor concurrently, you can use your computer for both parts of the task: consulting the information the report is about, and writing the report. You can switch back and forth while both programs are running, without disturbing the operation of either one.

Finally, some tasks are most readily performed by several programs running concurrently and exchanging information, rather than by a single program. Some of the "programs" you use may actually be groups of programs running concurrently, designed so that their separate nature is transparent to you. Thus, you may already be using CP/M's concurrency features without knowing it.

How To Run Programs Concurrently in CCP/M-86

Suppose that your computer offered you several consoles. You could run a different program on each console, and so run several programs concurrently.

In fact, you probably have only one console. Even so, most versions of CCP/M-86 let you run several programs concurrently on different *virtual consoles.* At any time, one virtual console is connected to your *physical console* (the terminal or the keyboard and screen that you use to communicate with your computer). A program running on this virtual console can display output on the physical console's screen and read input from its keyboard. We say that this virtual console is in the *foreground.*

The other virtual consoles are in the *background.* If one of them is running a program, CCP/M-86 saves the program's screen output until you switch that virtual console into the foreground; then it displays the output on the screen. If the program requests keyboard input, it must wait until you switch its console into the foreground and enter some.

From a program's point of view, all virtual consoles look the same. However, only one virtual console at a time is connected to the physical console.

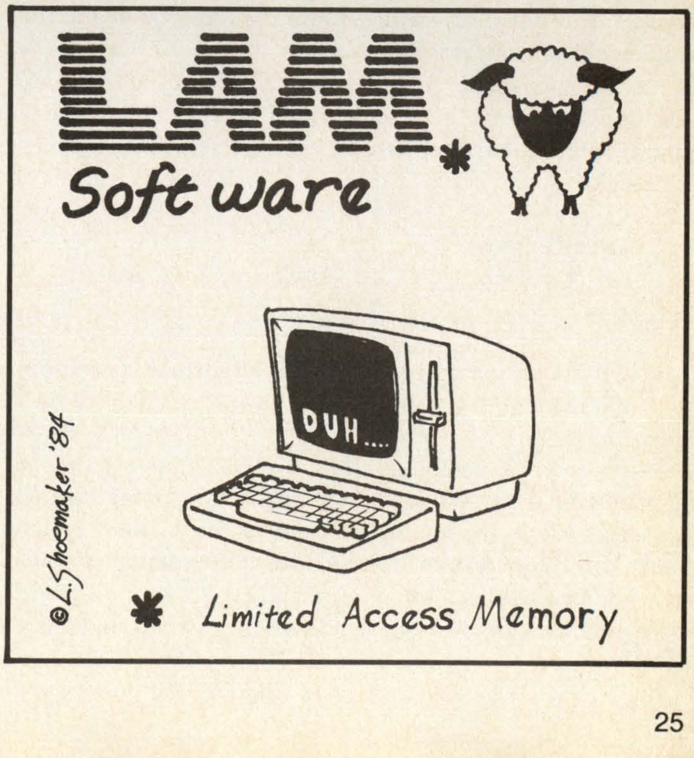
When you switch a virtual console into the foreground, the console previously in the foreground is automatically switched into the background. Its screen display is saved in RAM. When you switch that virtual console back into the foreground, its screen display is restored. Thus, you can switch virtual consoles freely without losing any of the data they are displaying on the screen.

Each virtual console is identified by a unique number. The first is number 0, the second is number 1, and so forth. Different computers support different numbers of virtual consoles, and use different means of switching them into the foreground. Consult your computer's CCP/M-86 user's manual for information on how to switch virtual consoles.

(Check the IBM PC, DEC Rainbow and CompuPro subsections for specific information.)

If your computer's version of CCP/M-86 supports virtual consoles, try switching virtual consoles now. First, run a command that displays some output; for example, run the TYPE command to display a short text file. Then switch to another console. The command's output disappears, since it was displayed on the virtual console you just switched into the background. In its place is another virtual console's command line prompt.

Now enter `SDIR` (enhanced directory display for CCP/M-88 and MP/M-86). Immediately after pressing Return, switch back to your original virtual console. The command you entered is running on the second virtual console, but since you have switched back to the first one, all you see on



the screen is TYPE's output.

Switch back to the second virtual console again. The output of SDIR should be waiting for you.

One obvious advantage of using concurrency is the ability to start a print operation, place the operation in the background, and start another operation of any kind. You could be working on new chapters while printing the finished ones, or use a spreadsheet while printing a listing of a data base.

See the accompanying Concurrent CP/M-86 and MP/M-86 tutorial excerpt ("Using Your Printer").

You can easily run programs and print files concurrently by starting PRINT in one virtual console and then switching to another. This is a simple example of how useful CCP/M-86's concurrency feature can be.

Dynamic and Buffered Modes

CCP/M-86 normally saves each background console's output in RAM. CCP/M-86 allows each console enough RAM to save one screenful of displayed data. If a program sends more than one screenful of output for display, the earliest data is lost. When you switch the program's console into the foreground you will see only its last screenful of displayed data, just as if it had been running in the foreground and the earlier data had scrolled off the top of the display. When CCP/M-86 treats a console this way, we say the console is in *dynamic mode.*

CCP/M-86 can also run a console in *buffered mode.* When a console in buffered mode is running in the background, CCP/M-86 saves its output in a *buffer file.* When the console is switched into the foreground, CCP/M-86 reads the buffer file and displays all the output that the console produced in the background. If the buffer file or the disk holding the buffer file becomes full, CCP/M-86 makes the console wait until it is switched into the foreground and the contents of the buffer is displayed.

Let's demonstrate the difference between dynamic mode and buffered mode. First, enter the following command to guarantee that that your current virtual console is in dynamic mode:

```
A>vcmode dynamic↵
Background Mode for Virtual Console 0 set to Dynamic
A>
```

(CCP/M-86 normally starts with all virtual consoles in dynamic mode, but the mode could have been changed by a start-up file.)

Now enter a command that displays more than one screenful of data. While the command is running, switch consoles. Allow the command time to finish, then switch back. You'll see only the last screenful of the command's output. The rest has been lost.

Switch the current foreground console into buffered mode like this:

```
A>vcmode buffered↵
Background Mode for Virtual Console 0 set to Buffered
Maximum file size = 16K
A>
```

Now enter the same command that you entered a moment ago. While it is running, switch consoles. Let the command finish and switch back. CCP/M-86 will display all of the command's output, not just the last screenful of it.

If your computer's CCP/M-86 has a status line, the status line tells you whether the current console is dynamic or static. (See IBM PC subsection, "Concurrent Operations.")

Buffer Files

CCP/M-86 always puts buffer files on the *temporary drive.* Different versions of CCP/M-86 use different drives for this purpose. If you want to know which drive is your temporary drive, look for references to "Temporary drive" in the index of your CP/M user's manual. See "Concurrent Operations" in the IBM PC and DEC DEC Rainbow subsections.

CCP/M-86 creates a buffer file only when needed; that is, when a program generates screen output while running on a background console that is in buffered mode. The buffer file is allocated only as much space as it needs, and is erased as soon as its contents has been displayed. Thus you need not be concerned about buffer files accumulating on your disks.

CCP/M-86 allows each buffer file to grow to a certain maximum size. The default maximum is 16K, which is enough space to hold 8 screens full of data. To change the current foreground console's maximum buffer file size (and simultaneously put the console in buffered mode), enter the VCMODE command with the SIZE parameter:

```
A>vcmode size=32↵
Background Mode for Virtual Console 0 set to Buffered
Maximum file size = 32K
A>
```

You may set each console to any maximum buffer size from 1K to 8191K bytes (free disk space permitting).

To display the foreground console's current mode, and its maximum buffer file size if it is buffered, enter VCMODE with no parameters:

```
A>vcmode↵
Background Mode for Virtual Console 0 is Buffered
Maximum file size = 32K
A>
```

Restrictions On Switching Consoles

Some CP/M programs operate in ways that are incompatible with console switching. The IBM PC's DSKMAINT program, which formats and copies floppy disks, is one example.

When you are running such a program, CCP/M-86 does not let you switch consoles. If your computer has a status line, it says "NoSwitch" instead of showing the console's mode. When you end the program, the status line shows the console's mode again, and CCP/M-86 allows you to switch consoles.

How USER Affects Virtual Consoles

Certain CCP/M-86 commands like USER affect only the console they run in.

Suppose, for example, that all of your virtual consoles are initially in user area 0. With console 0 in the foreground, you enter `USER 5`↵. Then you switch to console 1. You're back in user area 0, since USER affected only console 0. If you switch back to console 0, you'll be in user 5 again.

This characteristic can be very convenient. For example, suppose you're writing a financial report and reviewing financial data concurrently. You customarily do word processing in user area 1, and keep financial data in user area 3. Run your word processor on a virtual console set to user area 1, and your data retrieval program on a virtual console set to user area 3, and you can switch between the two consoles without entering a USER command each time.

Along with the convenience comes a potential for confusion, though. If you want to run two or more virtual consoles in the *same* user area, you must remember to set each console to that area. Don't set the user area, switch consoles, and then wonder why all the files in the user area you set have disappeared!

How To Run Programs Concurrently in MP/M-86

The simplest way to run two programs concurrently is to use two or more consoles. MP/M-86 will run several programs for you on several consoles just as it would if each console were for a different user.

You can run two or more programs concurrently from one console, as long as only one program needs to read input from the keyboard or display output on the screen. You do this by starting the programs that do not need to do input or output, and then *detaching* them, one at a time.

For example, suppose you want to start and detach a program named FURNACE that controls a device that turns your building's furnace on and off. We'll assume that once FURNACE is running it prompts you for a command, but will do its job without displaying any output until you respond.

You would start FURNACE by entering the command FURNACE:

```
2A>furnace↵
*                           (This is FURNACE's prompt)
```

Then you would detach it from your console by entering Control-`D` (abbreviated `^D`). When you entered `^D` you would get CP/M's command line prompt:

```
2A>furnace↵
*^D                         (you detach FURNACE)
2A>
```

Now FURNACE is running detached from your console. You can run any other command without affecting FURNACE's operation.

FURNACE can continue running indefinitely, provided it does not try to read data from the keyboard or display data on the screen. If it tries to do either of those things, it will stop running until you re-attach it.

There are two ways to re-attach FURNACE to the console. First, you can enter `^D` at CP/M's command line prompt:

```
2A>furnace↵
*^D                         (you detach FURNACE.)
2A>^D
Attach: FURNACE             (You re-attach FURNACE.)
```

Second, you can re-attach FURNACE by running the ATTACH command with FURNACE as a parameter:

```
2A>furnace↵
*^D                         (You detach FURNACE.)
2A>attach furnace↵
                            (You re-attach FURNACE.)
Attach: FURNACE
```

Finally, you can cancel a task without re-attaching it first with the ABORT command. ABORT is described in the section "How To Escape From the Deadly Embrace," later in this article.

Multiple Detached Programs

You can start and detach two or more programs in succession if you want. For example, to run and detach FURNACE, then LIGHTS, you would enter:

```
2A>furnace↵
*^D                         (You detach FURNACE.)
2A>lights↵
*^D                         (You detach LIGHTS too.)
2A>
```

The number of programs you can run detached is limited only by the RAM your computer has to run programs in.

When you use `^D` to re-attach programs, MP/M-86 re-attaches them in the *same order* that it detached them. Thus, to re-attach and end FURNACE and LIGHTS, you might enter:

```
2A>furnace↵
*^D                        (You detach FURNACE.)
2A>lights↵
*^D                        (You detach LIGHTS too.)
2A>^D
Attach: FURNACE
```

(You re-attach FURNACE, which was detached first, and enter FURNACE's "end" command:)

```
e↵
2A>^D
Attach: LIGHTS
```

(You re-attach LIGHTS...

```
e↵                         (...and enter its "end" command.)
2A>
```

You can re-attach a particular process, regardless of order, with the ATTACH command. Thus, if you wanted to attach and end LIGHTS without disturbing FURNACE, you could enter:

```
2A>attach lights↵
Attach: LIGHTS
e↵
2A>
```

Similarly, you can abort a particular program with the ABORT command. (See the section "How To Escape From the Deadly Embrace," later in this article.)

You can only re-attach a program to the console it was started from. If you try to attach a program to a different console, you'll get an error message saying `Attach failed`. (You'll get the same message if you try to attach a program that doesn't exist.)

Displaying the System's Status

MP/M-86 and some versions of CCP/M-86 have commands that display the current status of the system, including the status of each program the system is running. These commands are meant primarily for programmers and system managers, but they display some information that can be useful to you.

System status displays present numbers in *hexadecimal notation.* This counting system, often used by computer programmers, is based on the number 16 instead of the number 10.

In decimal notation, which we use for our everyday affairs, there are ten digits, 0 through 9. The pair of symbols '10' represents the number ten. In hexadecimal notation there are sixteen digits, 0 through 9 and A (ten) through F (fifteen). The pair of symbols '10' represents the number sixteen.

In CCP/M-86

You can display several aspects of CCP/M-86's system activity with the SYSTAT command. SYSTAT can display a snapshot of system status, or can present a continuous display of current system status. The display is different for the DEC Rainbow and some other computers — see "Displaying the System Status" in the DEC Rainbow subsection for an example).

If you run SYSTAT with no parameters, it prompts you for the type of status display you want:

```
A>systat↵
Which Option?
H(elp)
M(emory)
O(verview)
P(rocesses - All)
Q(ueues)
E(xit)
->
```

Enter `H` to display information about the other SYSTAT options.

Enter `M` to display a map of RAM being used by application programs or free for their use.

Enter `O` to display an overview of the configuration of your computer's copy of CCP/M-86. Most computers' versions of CCP/M-86 allow you to change the parameters shown in SYSTAT's overview display by creating a new copy of CCP/M-86 with the GENCCPM command. (*If you're using a multi-user version of CCP/M-86*, this is a job for your system's manager.)

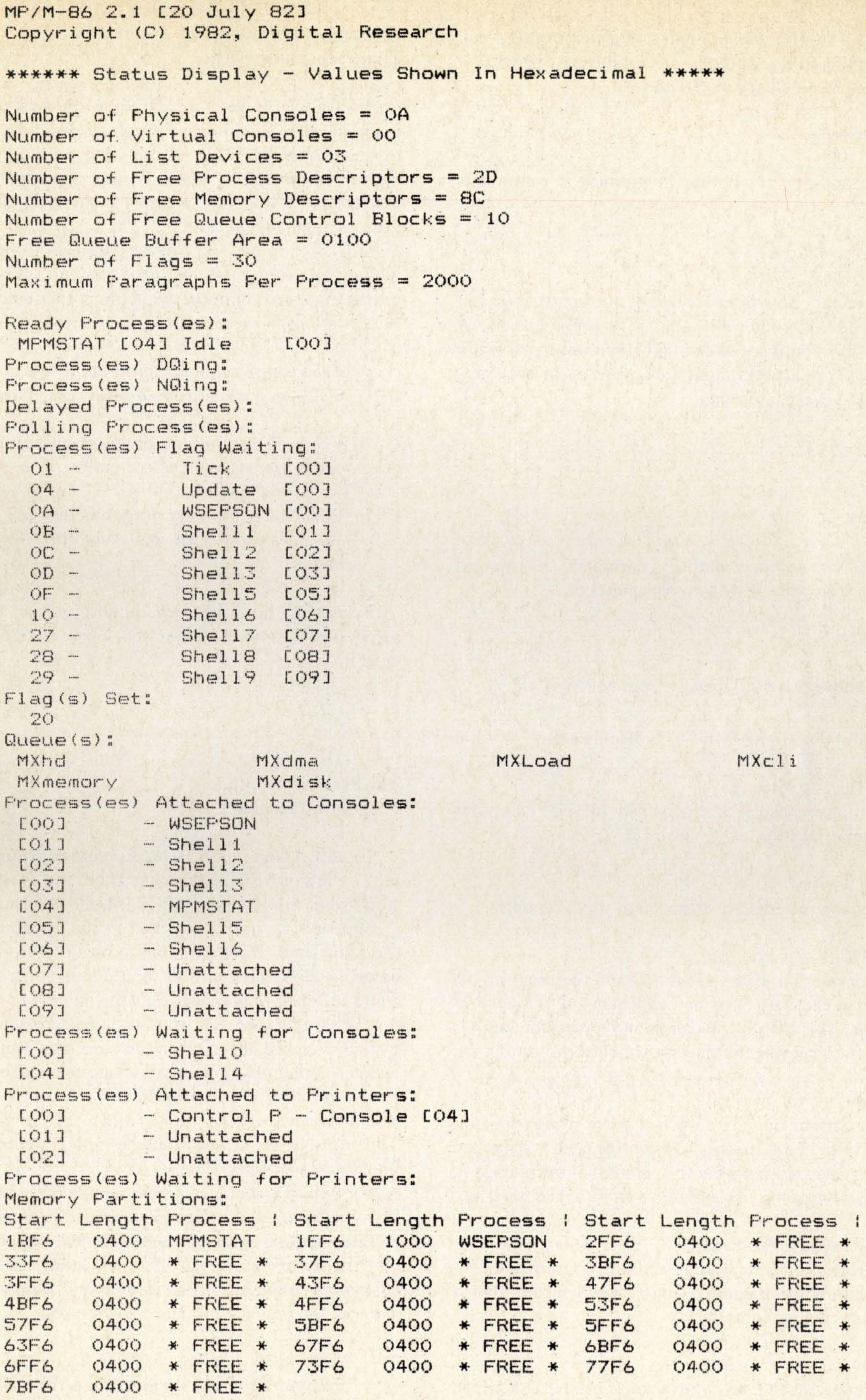
Enter `P` to display the processes (programs) the system is running and the resources being used by each.

Enter `Q` to display the names of queues in the system, with the processes (programs) that are reading from them and writing to each. (A *queue* is a list of data that CCP/M-86 keeps in RAM. Different programs co-ordinate their activities by reading and writing data in queues.)

Enter `U` to display the status of the user processes (programs) in the system; that is, all process that are not part of CCP/M-86 itself.

Enter `E` to return to CP/M.

If you select `M`, `P`, `Q` or `U`, SYSTAT asks you whether you want a continuous status display. Some people use SYSTAT to present a continuous status display in one console, letting them switch to that console to see what the system is doing at any time. Respond `Y` to get a continuous status display, or `N` to get a snapshot display. If you select a continuous display, enter `^C` to stop the display and return to CP/M.



```
MP/M-86 2.1 [20 July 82]
Copyright (C) 1982, Digital Research

****** Status Display - Values Shown In Hexadecimal *****

Number of Physical Consoles = 0A
Number of Virtual Consoles = 00
Number of List Devices = 03
Number of Free Process Descriptors = 2D
Number of Free Memory Descriptors = 8C
Number of Free Queue Control Blocks = 10
Free Queue Buffer Area = 0100
Number of Flags = 30
Maximum Paragraphs Per Process = 2000

Ready Process(es):
 MPMSTAT [04] Idle     [00]
Process(es) DQing:
Process(es) NQing:
Delayed Process(es):
Polling Process(es):
Process(es) Flag Waiting:
  01 -         Tick    [00]
  04 -         Update  [00]
  0A -         WSEPSON [00]
  0B -         Shell1  [01]
  0C -         Shell2  [02]
  0D -         Shell3  [03]
  0F -         Shell5  [05]
  10 -         Shell6  [06]
  27 -         Shell7  [07]
  28 -         Shell8  [08]
  29 -         Shell9  [09]
Flag(s) Set:
  20
Queue(s):
 MXhd                MXdma               MXLoad               MXcli
 MXmemory            MXdisk
Process(es) Attached to Consoles:
 [00]       - WSEPSON
 [01]       - Shell1
 [02]       - Shell2
 [03]       - Shell3
 [04]       - MPMSTAT
 [05]       - Shell5
 [06]       - Shell6
 [07]       - Unattached
 [08]       - Unattached
 [09]       - Unattached
Process(es) Waiting for Consoles:
 [00]       - Shell0
 [04]       - Shell4
Process(es) Attached to Printers:
 [00]       - Control P - Console [04]
 [01]       - Unattached
 [02]       - Unattached
Process(es) Waiting for Printers:
Memory Partitions:
Start Length Process | Start Length Process | Start Length Process |
1BF6   0400  MPMSTAT   1FF6   1000  WSEPSON   2FF6   0400  * FREE *
33F6   0400  * FREE *  37F6   0400  * FREE *  3BF6   0400  * FREE *
3FF6   0400  * FREE *  43F6   0400  * FREE *  47F6   0400  * FREE *
4BF6   0400  * FREE *  4FF6   0400  * FREE *  53F6   0400  * FREE *
57F6   0400  * FREE *  5BF6   0400  * FREE *  5FF6   0400  * FREE *
63F6   0400  * FREE *  67F6   0400  * FREE *  6BF6   0400  * FREE *
6FF6   0400  * FREE *  73F6   0400  * FREE *  77F6   0400  * FREE *
7BF6   0400  * FREE *
```

Figure 1. *A typical display produced by MPMSTAT (MP/M-86).*

To skip SYSTAT's menus, enter the menu option you want as a command line option. For example, to display display your system's memory map, enter:

```
A>systat [m]↵
```

You may add the `[C]` option to produce a continuous display:

```
A>systat [m c]↵
```

You can specify how often you want the continuous display to be updated by entering a one- or two-digit number of seconds as a third option. For example, this command would make SYSTAT produce a continuous display of user processes, updated every 5 seconds:

```
A>systat [m c 5]↵
```

In MP/M-86

MP/M-86's system status command is named MPMSTAT. You enter it with no parameters:

```
2A>mpmstat↵
```

Figure 1 shows a typical display from MPMSTAT.

Some useful data in MPMSTAT's display are:

`Number of Physical Consoles:`
How many consoles are attached to your computer ("Number of Physical Consoles").

`Number of List Devices:`
How many printers are attached to your computer.

`Process(es) Attached to Consoles:`
The consoles on your system and and the program attached to each. An entry named `Shelln` (`n` a number) represents the MP/M-86 command processor, and is listed for a console that has no attached program.

`Process(es) Waiting for Consoles:`
Any programs that are detached and waiting (not running), with the number of the console each is detached from. `Shelln`, representing the command line processor, is listed for each console that has an attached program.

`Process(es) Attached to Printers:`
The printers on your system, and the program and console that is using each. "Unattached" means that a printer is not being used.

`Process(es) Waiting for Printers:`
Any programs that are waiting for a printer to be freed by another program.

Concurrent Programs Using the Same File

Since CCP/M-86 and MP/M-86 allow several programs to run at the same time, two programs could theoretically try to write to the same file at the same time. If that actually happened, though, it would create a good deal of mischief. Therefore, CCP/M-86 and MP/M-86 have features to prevent it from happening.

Most of the time, you can use CCP/M-86 and MP/M-86 without knowing anything about how they prevent two programs from writing to the same file at the same time. There are situations, however, where that knowledge is important:

- When you're running a program that is not designed to run under a concurrent or multi-user system.
- When you're running a program whose multi-user provisions are not working correctly.
- When you're running programs that use several common files, and open and close the files at different times.

If none of these situations applies to you, then you can safely skip the rest of this section. Come back to it when you need it.

The Problem: Multiple Programs Changing a File

To understand how CP/M prevents programs from writing to the same file at the same time, you must first understand what would happen if CP/M allowed them to do so.

Suppose two users happened to start programs at about the same time, and used them to create files with the same name, in the same user area, on the same disk. Neither user could tell, before starting, that the name was "taken." Yet the file saved by the user who finished first would be replaced — that is, wiped out — when the other user's file was saved.

For another example, suppose one user started modifying a file while another was printing it. Each part of the print-out would reflect the file as it was when that part was printed. The print-out as a whole would not reflect the contents of the file as a whole at *any* time.

For a third example, consider a data base for a mail order firm that contained a file of data about customers and a file of data about inventory in the warehouse. Suppose the inventory file showed that there were ten widgets in stock. If two customers called at the same time and each ordered eight widgets, the following things could happen:

1. Order taker A takes customer A's call, and fetches the inventory record for widgets and the customer record for customer A.

2. A moment later, order taker B takes customer B's call, and does the same.

3. Order taker A enters an order for eight widgets. The order entry program updates the customer file to show that customer A has ordered eight widgets. At the same time, it updates the inventory file to show that eight of the ten widgets in stock should be shipped to customer A.

4. A moment later, order taker B does the same for customer B. Since order taker B still is using data showing that there are ten free widgets, the order entry program wipes out A's update to the inventory file as it makes B's update.

Now the customer file would say that customers A and B have each ordered eight widgets. The inventory file would say that of the ten widgets in stock, eight should be shipped to customer B, and two are free; it would have no record of widgets to be shipped to customer A. The data base not only would have lost information; it wouldn't even be self-consistent.

These examples are presented in terms of two users with conflicting intentions, but in CCP/M-86 you could just as easily run conflicting programs yourself. It could happen any time you failed to consider how two concurrent operations might interact, or neglected to learn all about the file operations a program performs before you used the program.

The Solution: CP/M Prevents Multiple Programs Changing a File

CP/M avoids this problem with a feature called *file locking*. File locking ensures that two programs won't try to perform conflicting operations on the same file at the same time.

The file locking feature recognizes three basic modes of access to a file:

Read-write access

This mode is appropriate for reading, creating, erasing, or modifying a file. While one program has read-write access to a file, no other program may access the file in any way.

Read-only access

This mode is appropriate only for reading a file. While one program has read-only access to a file, other programs may access the file only in read-only mode.

Shared access

This mode is appropriate for any sort of operation *if all programs that use the file have a mutually agreed means of avoiding conflicts*. While one file has shared access to the file, other programs may access the file only in shared mode.

Let's consider how record locking affects our three examples.

In the first example, each program would request CP/M to create the file in read-write mode. When the second user's program requested the file, CP/M would tell it that the file was already in use in a conflicting mode. The program, in turn, could prompt the user to choose a different file name.

In the second example, the printing program would request the file in read-only mode. Then the other program would request the file in read-write mode. Again, CP/M would tell the other program that the file was in use in a conflicting mode. The program could advise the user of this, and the user could perform some other operation or wait until the file was free.

In the third example, the order entry program would request the file in shared mode for each order taker. The program would be designed to lock individual records, so that order taker B could not read the record for widgets until order taker A was done using it. When order taker B got the record for widgets, it would say that only two free widgets were left.

You do not have to set file access modes yourself. They are set automatically by each program that you run, each time it requests access to a file. Two programs cannot perform conflicting operations on a file because CP/M will not allow them to access the file in conflicting modes.

If a program requests a file without specifying an access mode (because it was designed to run under CP/M-86, for example), CP/M acts as if the program specified read-write mode. This eliminates any risk of a conflict, at the cost of denying other programs access to a file when it may not be necessary to do so.

If you try to use a file in a manner not allowed by the file locking feature, one of these things will happen:

- Your program will display an error message that says something like `ERROR: OPEN FILE INCOMPATIBLE MODE`, and will terminate.
- Your program will tell you that the file is in use, and prompt you to do something else.
- If your program was designed to run under CP/M-86, it may give you a misleading error message like `CAN'T FIND FILE` or `DISK SPACE EXHAUSTED, CAN'T CREATE FILE`. Be aware that under CCP/M-86 and MP/M-86, such messages *may* mean that there is an access mode conflict.

There are ways that programs can circumvent CP/M's file locking feature. Thus it *is* possible for programs to perform conflicting file operations and garble files. Not many programs can do this — none of CP/M's commands can — and you need not be concerned about it from day to day. Keep it in mind as a possibility, though, if any of your files should become garbled.

Another Problem: Waiting For a Resident System Process

A common cause for system waits is competition for use of a *resident system process* (RSP). An RSP is a command that is not truly a built-in part of CP/M, but is always kept in RAM because it is frequently used. *In CCP/M-86*, the DIR command is an example of an RSP.

Only one user at a time may run a given RSP. For example, if you try to run DIR while another user is running it, your DIR command cannot start until the other user's DIR is done. If the other user enters `^S` while running DIR, you may wait a long time. (For this reason, some CP/M systems disable `^S` while DIR is running.)

Another Problem: the Deadly Embrace

Another sort of file management problem can arise when several programs use several files in different orders.

For example, consider two programs, A and B, that use the same two files, X and Y. Program A reads file X; after it has been running for a while, it modifies file Y. If it can't get access to file Y, it waits. Program B reads file Y; after it has been running for a while, it modifies file X. It it can't get access to file X, it waits.

If both programs were started at about the same time, here's what would happen:

1. Program A would start running. It would request and receive read-only access to file X.

2. Program B would start running. It would request and receive read-only access to file Y.

3. Program A would request read-write access to file Y. Since program B had read-only access to file Y, A's request would be denied. A would wait.

4. Program B would request read-write access to file X. Since program A had read-only access to file X, B's request would be denied. B would wait.

Neither program can proceed; each is waiting for a file that the other is using, and neither will give up the file it is using until it gets the file it is waiting for. This sort of logjam is known as a *deadly embrace*.

This sort of program does not occur only with files. It can result from competition among programs for any combination of resources that can't be shared. Such resources include files, disk drives, printers, and RAM.

There is no general way to prevent a deadly embrace from happening, except to make every program reserve all the resources it needs at the same time. That measure is so restrictive that most operating systems (including CP/M) do not require it, and most application programs do not try to do it.

If your computer literally coasts to a stop — if one program after another begins waiting, until everything is waiting for something else — a deadly embrace is the most likely cause.

How To Escape From the Deadly Embrace

The easy way to break a deadly embrace is to cancel programs until things start to move again. Depending on what programs you're running, this may not be an attractive choice. It could leave file in an unusable state, for example, or it could make you lose a significant amount of work.

A more refined way to break a deadly embrace is to figure out exactly what caused it, and cancel only the program or programs that prevent everything else from running. In the simple example above, you would determine that you could break the embrace by cancelling either program A or program B.

Once you understand the specific cause of the deadly embrace, you may be able to take steps to prevent it. You may be able to reorganize your files so that programs now using the same file can use different ones, or to reorganize your operations so that the programs are less likely to be run at the same time.

Identifying the cause of a deadly embrace requires complete knowledge of the resources being used by each program on your computer — something you may not have, since programs often use system resources such as temporary files and queues without telling you what they are doing. SYSTAT (in CCP/M-86) or MPMSTAT (in MP/M-86) are some help, since they list all the programs in the system and some of the kinds of resources used by each. Neither command lists the files used by each program, though, and often that is precisely the information you need.

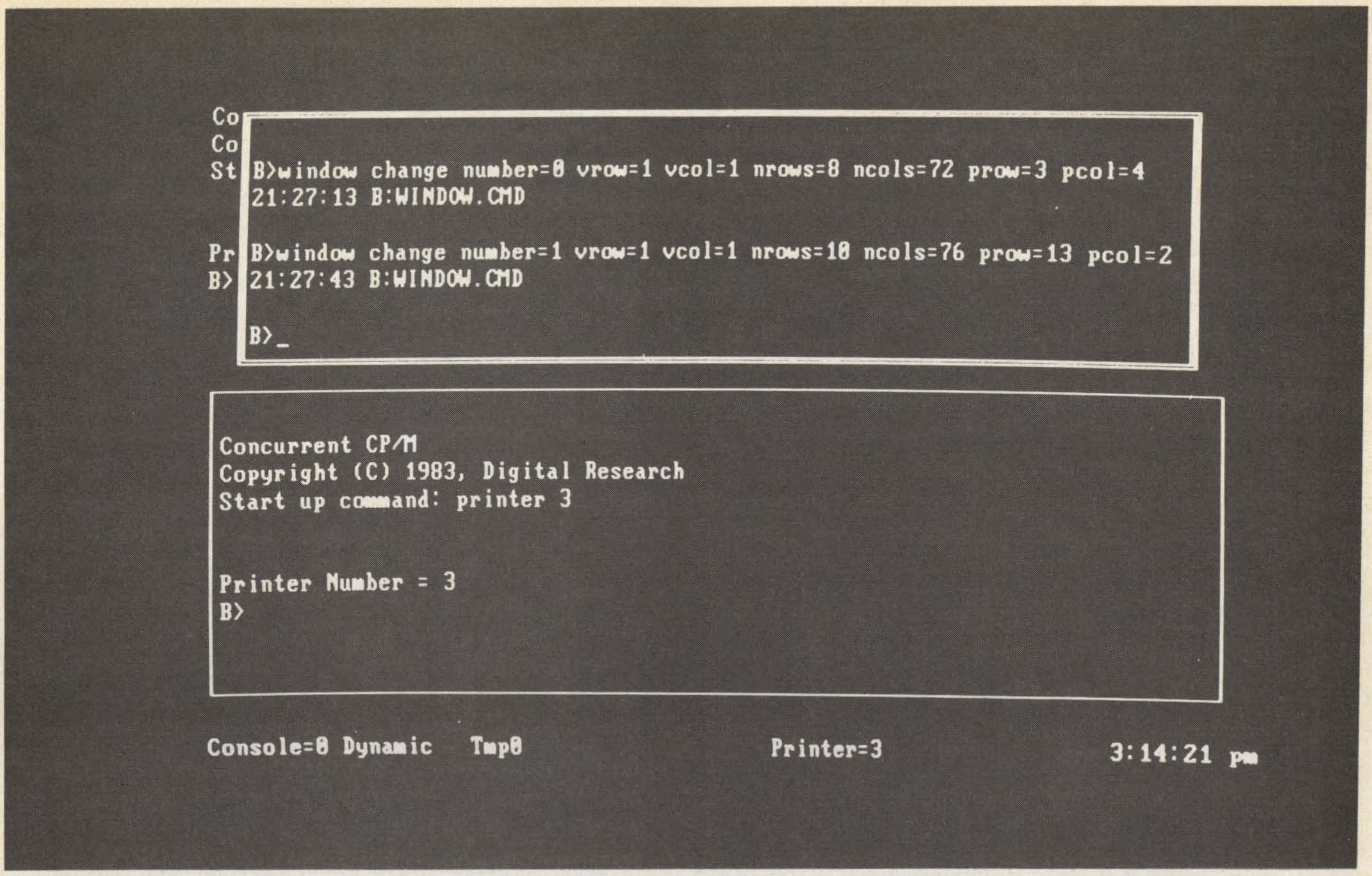
If a program has its own "exit" command, use that command to cancel it. If not, or if the "exit" command doesn't work, use `^C`. If `^C` doesn't work either, you can cancel the command by running the ABORT command on another console:

```
A>abort program console ↵
```

For `program`, substitute the name of the program you want to cancel. For `console`, substitute the number of the console the program is running in: *if you're using CCP/M-86* the virtual console number, or if you're using MP/M-86 the real console number. (For CompuPro systems, see the CompuPro subsection.)

For example, suppose you want to cancel a program named GIRAFFE, running on console 3. You would enter on another console:

```
A>abort giraffe 3 ↵
```



```
Co
Co
St B>window change number=0 vrow=1 vcol=1 nrows=8 ncols=72 prow=3 pcol=4
   21:27:13 B:WINDOW.CMD

Pr B>window change number=1 vrow=1 vcol=1 nrows=10 ncols=76 prow=13 pcol=2
B> 21:27:43 B:WINDOW.CMD

   B>_


Concurrent CP/M
Copyright (C) 1983, Digital Research
Start up command: printer 3


Printer Number = 3
B>



Console=0 Dynamic   Tmp0                  Printer=3             3:14:21 pm
```

Figure 2. *With the windowing feature of Concurrent CP/M-86, your screen can be split into halves.*

Use the CONSOLE command to find out what console you are running on:

```
A>console↵
Console = 5
```

If you're using MP/M-86, don't cancel another user's program without consulting that user first! If possible, consult your system's manager too.

The Windowing Facility (CCP/M-86 Only)

Switching among different virtual consoles is a valuable capability, but it lets you see only one console's display at a time. That can be a major limitation. For example, suppose you were reviewing financial results with a data retrieval program on one virtual console while writing a report with a word processor on another. You'd probably want to transfer numbers from the retrieval program to the word processor. To do so with the skills you've learned so far, you'd have to write the numbers down, switch consoles, and type them in again.

Many versions of CCP/M-86 have *windowing* features that eliminate the need for that. Windowing lets you see the displays of two or more virtual consoles at the same time, and even move data directly from one virtual console to another.

To appreciate the concept of windowing, imagine that your console's screen is split into two halves, as in figure 2. Each half of the screen displays part of the output of one console. Thus you can see what is happening in *both* consoles, no matter which one is in the foreground.

When a screen is split in this way, each part of it is called a *window*. This term suggests that each part of the screen is like a hole through which you can view a part of what happening on a virtual console, just as you could look through a window of a house to see what is happening in the street.

In fact, that is exactly how windows work in CCP/M-86. From the system's point of view, every one of your virtual consoles is displaying its output all of the time on its own "virtual screen." You can see what is happening on each virtual console through a window that looks onto some part of that console, and reveals its contents on some part of your physical console.

Windowing is highly dependent on the design of a computer's display hardware, and so it is done differently on each computer. Consult your computer's CCP/M-86 user's manual for information on whether and how your computer supports it. See the IBM PC subsection for a detailed description of the windowing feature on the IBM PC.

The Meaning of Concurrency .... Page 24

Concurrent CP/M-86
and MP/M-86 Tutorial .... Page 50

Concurrent CP/M-86 for the DEC Rainbow.

This section contains specific information relating to the accompanying articles in this issue: "The Meaning of Concurrency" and the "Concurrent CP/M-86 and MP/M-86" tutorial, both by Jonathan Sachs.

This section is adapted from *The Osborne/McGraw-Hill Guide to CP/M-86* by Jonathan Sachs, © 1984 by Osborne/McGraw-Hill, Inc. Concurrent CP/M-86 is abbreviated "CCP/M-86" except where it performs just like CP/M-86, when it is referred to as "CP/M."

The Digital Equipment Corp. (DEC) version of CP/M-86 (called CP/M-86/80) can run both eight-bit CP/M-80 software and sixteen-bit CP/M-86 software. Concurrent CP/M-86 for the DEC Rainbow is also available (runs only sixteen-bit software).

Searching For a Command

CP/M-86/80 goes through all of generic CP/M's searching steps to find a CMD file. If it does not find the CMD file, it searches the current user area for a CP/M-80 program (with the filetype COM), then searches user area 0 for a CP/M-80 programs with the SYS attribute.

The DEC Rainbow version of CCP/M-86 makes the highest-lettered hard disk the system disk when you boot. If your DEC Rainbow has no hard disk, CCP/M-86 makes the highest-lettered floppy disk drive the system disk.

You can change the system drive by running the SETSYS command. For example, to make drive A the system disk:

```
A>setsys a: ↵
```

Printing the Contents Of the Screen

If you're using CP/M-86/80, you can print the contents of the screen by pressing the Print Screen key alone (don't press the Ctrl key).

If you're using CCP/M-86, you can print the contents of the screen by running the PRNTSCRN command. See the article on "The Meaning of Concurrency" to learn how to run PRNTSCRN without disturbing the contents of the screen — even while another program is running — by switching to a different "virtual console."

How To Print a Screen (CCP/M-86 Only)

Run PRNTSCRN like this:

```
E>prntscrn ↵
```

PRNTSCRN presents a menu; select option 2 and press the Do key. Then select the virtual console you are running in and press the Do key. (If you don't know about virtual consoles yet, you are probably running in virtual console 1.)

PRNTSCRN prints the contents of the screen and moves the printer to the top of the next page. Then it redisplays its main menu. Press the Exit key to return to CP/M.

Variations On PRNTSCRN

If you have a DEC LA50 or LA100 printer, you can make

PRNTSCRN's printout include most of the graphic characters that appear on your screen (the lines used to make boxes around menus, and so forth). To do this, select option 1 instead of option 2 from PRNTSCRN's initial menu.

If you must interrupt PRNTSCRN's printing operation for any reason, press the Interrupt key. To make PRNTSCRN resume printing, press the Resume key; to abandon the printing operation and return to PRNTSCRN's main menu, press the Main Screen key.

You can also return to CP/M from any of PRNTSCRN's prompts by pressing the Exit key.

Saving the Screen Contents In a File (CCP/M-86 Only)

You can write the contents of a screen to a file by selecting option 3, 4, or 5 from PRNTSCRN's main menu. The three options differ in the way they handle graphic characters. If you expect to print the contents of the file on a DEC LA50 or LA100 printer, you should generally choose option 3. If you expect to print it on another kind of printer, choose option 5.

Whichever option you choose, PRNTSCRN prompts you for a name to give the file it will write the screen to. Enter a name and press RETURN. PRNTSCRN presents its main menu. Proceed as you would if you were printing a screen.

You can write screens to only one file per run of PRNTSCRN. If you write several screens to the file in the same run of PRNTSCRN, each screen is appended to the earlier ones. If you write screens to the same file in *different* runs of PRNTSCRN, however, each run of PRNTSCRN *wipes out* the screens written by the preceding run.

Concurrent Operations Using CCP/M-86

CCP/M-86 supports five virtual consoles, numbered 0 through 4. Consoles 1 through 4 are intended for you to use for running programs. Virtual console 0 is reserved for a program named CONSOLE0, which produces a continuous display of the Rainbow's system status.

When you boot, virtual console 1 normally is in the foreground. To switch any virtual console into the foreground, enter `^0`, `^1`, `^2`, `^3`, or `^4`, using the numeric keypad keys. The number keys on the top row of the keyboard won't work.

If your Rainbow has at least one hard disk partition accessible to CCP/M-86, the drive you booted from becomes the temporary drive. If not, the highest-lettered floppy disk drive becomes the temporary drive.

You can change the temporary drive with the second parameter of the SETSYS command:

```
E>setsys e: m: ↵
```

In this example, SETSYS makes drive E the system drive, and drive M the temporary drive.

If you run SETSYS with only one parameter (specifying only a system drive), SETSYS makes the temporary drive the same as the system drive. If you type a question mark as a parameter with SETSYS, it displays the temporary drive assignment.

How Commands Like USER Affect Virtual Consoles

The KEYSET and KEYLOAD commands affect only the virtual console they are run in. If you want to change the function key definitions for all virtual consoles, you must run one of these commands in each console.

The PRNTSCRN command can print or record the contents of any virtual console's screen, or all of their screens. By its nature, it is normally run in one console to print or record the contents of another.

The SETUP command's "console parameters" group affects the virtual consoles individually. The parameters in this group are:

- Regular video display (light characters on dark background) or reverse video display (dark characters on light background.
- Line width (80 or 132 characters).
- Cursor type (block or underscore).
- Terminal emulation (ANSI standard or VT52).
- Screen margin bell on or off.
- End-of-line wrapping on or off.
- Display scrolling rate (three selectable speeds or jump scroll).

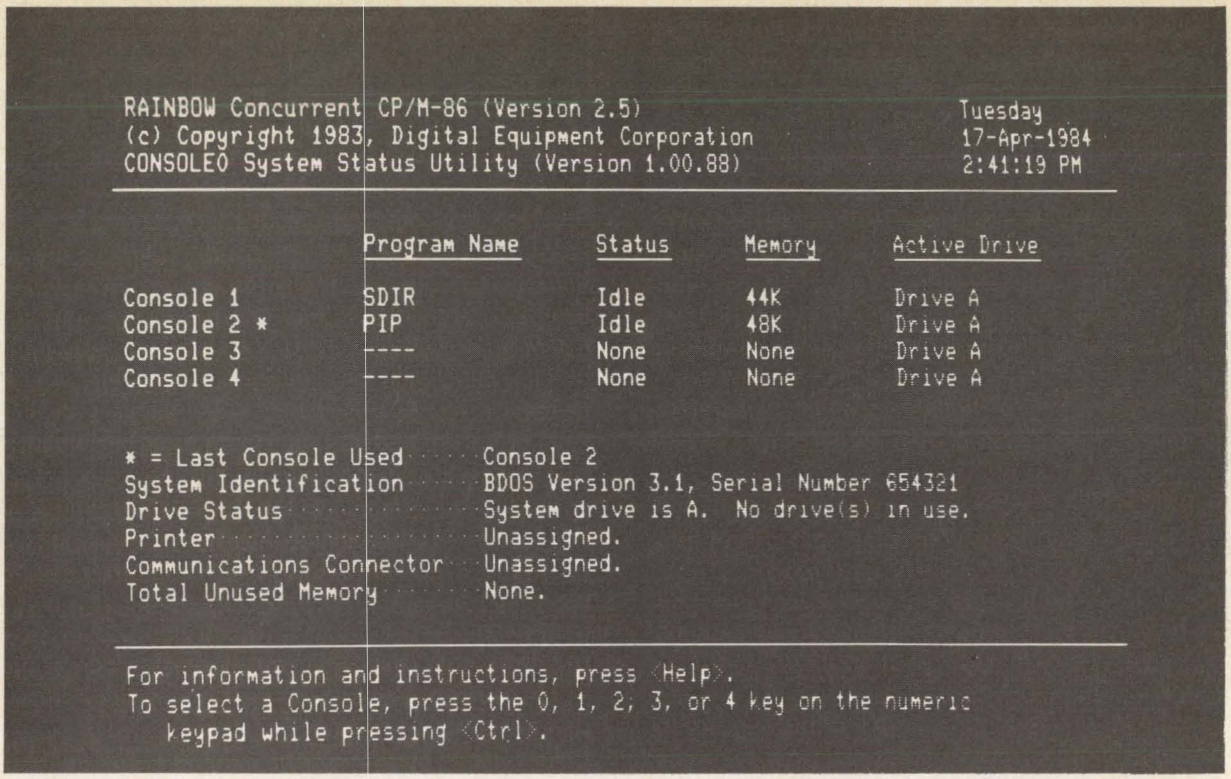
Displaying System Status (CCP/M-86 Only)

On the DEC Rainbow, the preferred way to inspect the system's status is to switch console 0 into the foreground. The standard startup file for console 0 runs a program named CONSOLE0, which produces a continuous status display. CONSOLE0 normally continues running as long as CCP/M-86 is running.

Figure DEC-1 shows a typical status display presented by CONSOLE0. Near the top is a table showing the status of each virtual console. The significant columns in the status display are:

`Program Name`

What program (if any) is running on each console. The virtual console that was in the foreground just before you switched to console 0 is marked by a star.



```
RAINBOW Concurrent CP/M-86 (Version 2.5)                          Tuesday
(c) Copyright 1983, Digital Equipment Corporation                 17-Apr-1984
CONSOLE0 System Status Utility (Version 1.00.88)                  2:41:19 PM
-----------------------------------------------------------------------------

                     Program Name      Status      Memory      Active Drive

Console 1            SDIR              Idle        44K         Drive A
Console 2 *          PIP               Idle        48K         Drive A
Console 3            ----              None        None        Drive A
Console 4            ----              None        None        Drive A


* = Last Console Used·········Console 2
System Identification·········BDOS Version 3.1, Serial Number 654321
Drive Status··················System drive is A.  No drive(s) in use.
Printer·······················Unassigned.
Communications Connector······Unassigned.
Total Unused Memory···········None.

-----------------------------------------------------------------------------
For information and instructions, press <Help>.
To select a Console, press the 0, 1, 2, 3, or 4 key on the numeric
   keypad while pressing <Ctrl>.
```

Figure DEC-1. *Typical status display presented by CONSOLE0. Near the top is a table showing the status of each virtual console.*

`Console Status`

`Busy` if the program is running, `Idle` if the program is waiting for input or for system resources, or `None` if no program is present.

`Memory`

How much RAM the program is using.

`Active Drive`

The virtual console's default drive.

The following significant items are displayed below the table:

`System Identification`

The version number of your copy of CCP/M-86, and a serial number that uniquely identifies your copy. When you need assistance from Digital Research or your dealer, you may be asked to give this number to identify yourself as a user of a properly licensed copy of CP/M.

`Drive Status`

The name of the current system drive.

`Drives(s) In Use`

The names of the disk drives now in use. It is safe to change a disk whenever the disk's drive name is *not* listed here.

`Printer`

Which virtual console, if any, is using the printer.

`Communications Connector`

Which virtual console, if any, is using the communications port.

`Total Unused Memory`

How many kilobytes of RAM are now unused. The smallest value shown while you are running a program tells you how much RAM you can give to a memory disk without impairing the operation of that program.

Note that the unused memory may not be in a single block. You may not be able to run a program that needs more RAM than is available in a single block, even if more free RAM is available than the program needs.

You can terminate CONSOLE0 by pressing the Interrupt key, letting you run another program on console 0. This is useful if you otherwise have no free RAM to run a program in. For example, suppose you have started a program that unexpectedly took all of your Rainbow's free RAM, and then would not let you terminate it. You could terminate the program by shifting to virtual console 0, terminating CONSOLE0, and running ABORT.

As a general practice, though, it is unwise to run programs other than CONSOLE0 on console 0. The Rainbow's CCP/M-86 is not designed to be used this way. For example, it won't let you limit the amount of RAM a program running in console 0 may take.

SYSTAT is in the Rainbow's CCP/M-86 distribution package in case you want it. It is on the disk labelled "GSX."

IBM PC

The Meaning of Concurrency .... **Page 24**

Concurrent CP/M-86 and MP/M-86 Tutorial .... **Page 50**

Concurrent CP/M-86 for the IBM Personal Computer.

This section contains specific information relating to the accompanying articles in this issue: "The Meaning of Concurrency" and the "Concurrent CP/M-86 and MP/M-86" tutorial, both by Jonathan Sachs.

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How CCP/M-86 Searches for ".CMD" Files

CCP/M-86 makes the lowest-lettered hard disk the system disk when you boot. If your PC has no hard disk, CCP/M-86 makes the *highest*-lettered floppy disk drive the system disk.

Thus, system disk is initially disk B on either of the most common configurations: a PC with two floppy drives and no hard disk, or a PC with one floppy drive and one hard disk.

You can change the system drive by running the SYSDISK command. For example, to make drive A the system disk:

```
A>sysdisk a:↵
```

CCP/M-86's files won't all fit on one of the PC's floppy disks; that is why two-floppy PC's have two CCP/M-86 disks, a boot disk and a system disk. After you boot such a system, you can use SYSDISK to free drive B for data disks:

1. Boot with the boot disk in drive A and the system disk in drive B.
2. Enter the command `SYSDISK A:↵`.
3. Remove the boot disk from drive A and put it away.
4. Move the system disk from drive B to drive A.

Printing and Computing At the Same Time

You queue a file with the PRINT command, which takes the file's name as a parameter:

```
A>print b:example.txt↵
```

Before CP/M starts printing a queued file it sends a form feed to the printer, advancing the printer to the top of a new page. This separates each file's printout from the preceding one.

Queuing Multiple Files

You can queue several files at once by running PRINT with several parameters. You may also queue several files by running PRINT several times, with or without running other programs in between.

The print queue can hold any number of files, provided the total length of the queued files' names is 128 characters or less. This means that the queue can hold at least nine files.

The print queue cannot hold files from two or more user areas at the same time. To queue print files from different user areas you must queue files from one area, let the queue become empty, change user areas, and then queue more files.

You can terminate printing of the current print file, and prevent printing of any other files in the print queue, by entering PRINT with the parameter OFF:

```
A>print off↵
```

After running `PRINT OFF↵` you should press your printer's form feed button, since CP/M does not send a form feed to the printer after the last printed file.

Using SUBMIT

You can cancel a program in a SUBMIT file by entering Control-Break (Control and Break keys) while the program is running. CP/M displays its usual prompt:

```
*** User Program Break ***    Return to CP/M (Y/N)?
```

If you respond `Y`, CP/M terminates the current program *but proceeds to the next command in the SUBMIT file* instead of terminating the SUBMIT file. If you respond `N`, CP/M allows the current command to resume running after you press any typing key, *but cancels the SUBMIT file when the command ends.*

Concurrent Operations (CCP/M-86)

When you boot, virtual console 0 is in the foreground. To switch to another virtual console, enter `^1`, `^2` or `^3` *using the numeric keypad's* `1`, `2` *or* `3` *key*. It doesn't matter whether the numeric keypad is set to enter numbers or control functions when you do this, but you *must* use the keypad keys; the number keys on the top row of the keyboard won't work.

The status line shows what virtual console you're running on. When you enter `^1`, for example, the status line changes from `Console=0` to `Console=1`.

The status line also tells you whether the current console is in dynamic mode or buffered mode. Immediately after `Console=n` on each virtual console is the word `Dynamic` or the word `Buffered`. While the console is displaying data accumulated in a buffer file, `Buffered` is replaced by `Purging`.

The SYSDISK command does *not* affect the disk used to store buffer files.

Of the commands unique to the PC's version of CCP/M-86, FUNCTION affects each virtual console independently. CONFIG and SYSDISK do not. The "commands" beginning with Esc (Escape key), which control the status line display, do not. (The status line does not belong to any one virtual console.)

DSKMAINT cannot be run concurrently with other programs. It cannot be started while any background console is running a program, and you cannot switch consoles while it is running.

SYSTAT is classed as a programmer's utility, and so is not part of the basic CCP/M-86 package. It is packaged with the Assembler Plus Tools product for the IBM PC.

How Windows Behave (CCP/M-86)

The following two commands will create two windows on your screen. Put virtual console 0 in the foreground now, and enter these commands.

```
B>window change number=0 vrow=1
          vcol=1 nrows=8 ncols=72 prow=3 pcol=4 ↵

B>window change number=1 vrow=1
          vcol=1 nrows=10 ncols=76 prow=13 pcol=2 ↵
```

Don't try to figure out how the commands work yet. You'll be better able to understand how to create windows after you experiment with them a bit and learn how they behave.

Once you've entered these commands, your screen should look something like figure PC-1. You've defined two windows which don't quite fill your screen. The upper one looks onto virtual console 0; the lower one looks onto virtual console 1. For convenience, we'll call these windows "window 0" and "window 1."

You may be surprised to see some text on the screen that's outside both of the windows you've just defined. Ignore it; it's supposed to be there, and you'll find out why in an upcoming section.

Enter some other commands, such as SDIR and TYPE. Notice how CCP/M-86 scrolls the display within console 0's window without affecting anything else on the screen.

Enter `^1` to put virtual console 1 in the foreground. The cursor moves from window 0 to window 1. Try entering another command. Console 1 runs it, and its output appears in window 1.

Notice that the double border that was around window 0 has been moved to window 1. This double border always surrounds the foreground console's window.

What the WINDOW Command Did

As you've probably guessed, the WINDOW command creates a window. The WINDOW parameters you entered above illustrate all of a CCP/M-86 window's essential attributes.

Let's analyze the first WINDOW command you entered. The parameter `CHANGE` simply means that WINDOW is being used to change (or create) a window. The parameter `NUMBER=0` identifies the virtual console whose window is being changed.

`VROW` and `VCOL` position the upper left corner of the window on the virtual screen. `VROW=1` and `VCOL=1` specify that the upper left corner of the window should contain the character in the first column of the first row (the first line) of the virtual console. That is, the upper left corner of window 0 is to be positioned over the upper left corner of virtual console 0 (see figure PC-2).

`NROWS` specifies the number of rows the window is to display. `NCOLS` specifies the number of columns. These parameters give the *interior* dimensions of the window. If you count the window's borders, it occupies two more rows and two more columns than that.

The four parameters `VROW`, `VCOL`, `NROWS`, and `NCOLS` specify the size of the window and the part of the virtual console that it looks onto.

`PROW` and `PCOL` position the upper left corner of the window on the *physical* screen. That is, they determine where the window will appear on your terminal or display. PROW=3 and PCOL=4 specify that the character in the upper left corner of the window should appear in the 4th column of the 3rd row of the physical screen.

Let's summarize what you've learned so far:

`CHANGE`

Specifies that WINDOW is being used to change or create a window.

`NUMBER`

Specifies the virtual console whose window is being changed or created.

`VROW` and `VCOL`

Specify which character of the virtual console's screen will appear in the upper left corner of the window.

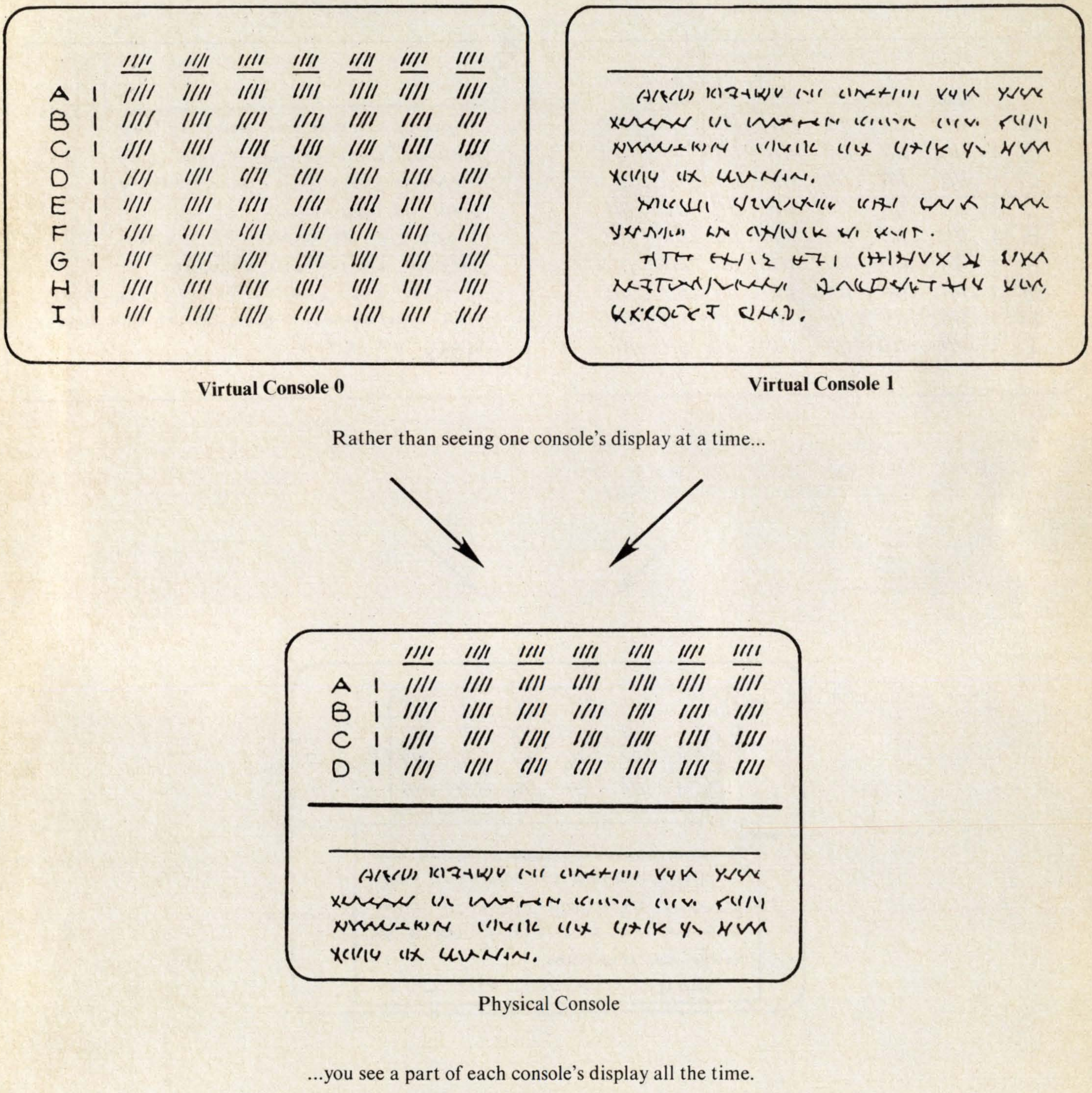

A
B
C
D
E
F
G
H
I
Virtual Console 0
Virtual Console 1
Rather than seeing one console's display at a time...
A
B
C
D
Physical Console
...you see a part of each console's display all the time.

Figure PC-1. *Defining windows on the IBM PC using Concurrent CP/M-86. The upper one looks onto virtual console 0, and the lower one looks onto virtual console 1.*

`NROWS` and `NCOLS`

Specify the window's height in rows and width in columns.

`PROW` and `PCOL`

Specify the position the upper left corner of the window is to have on the physical console's screen.

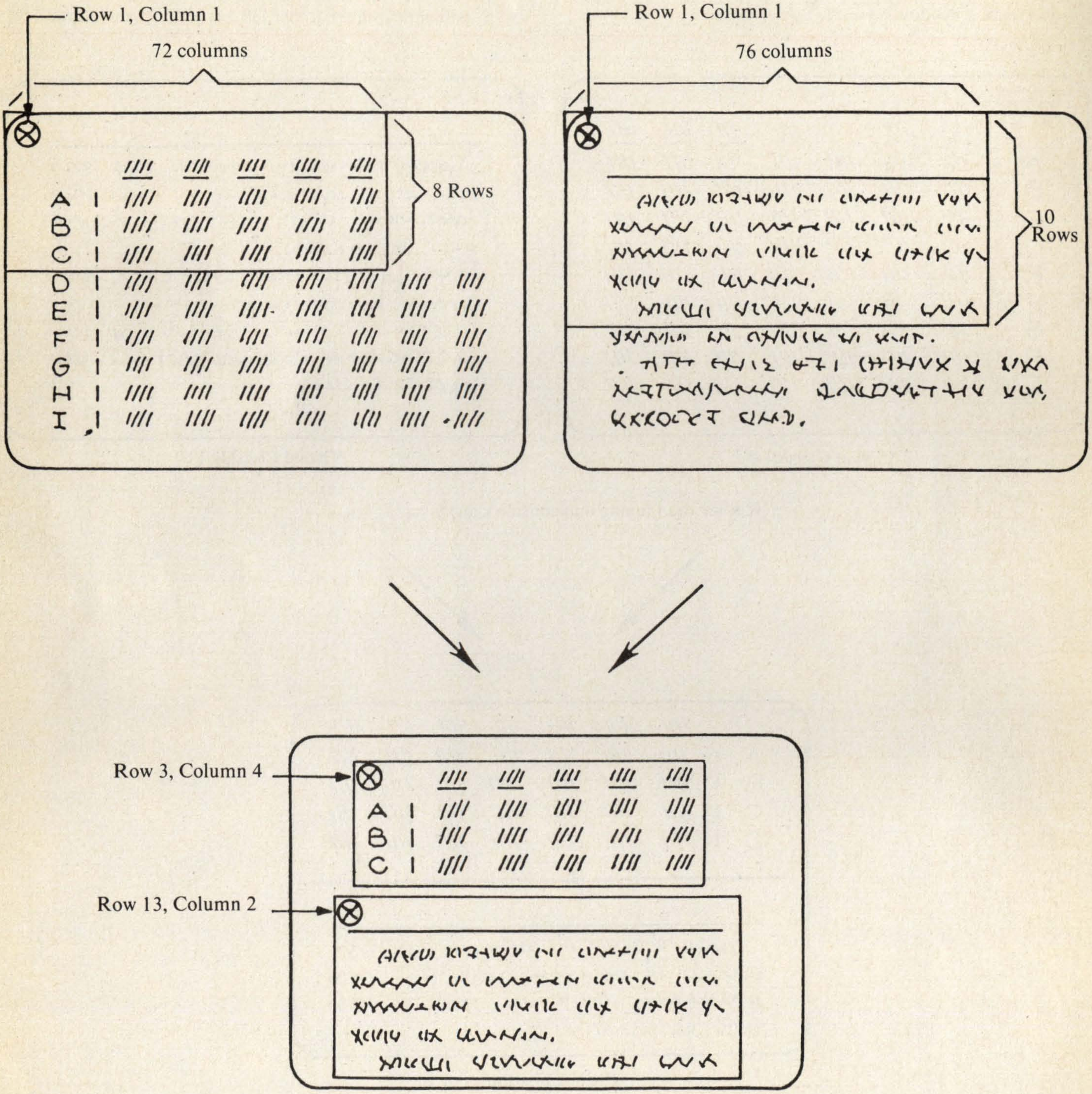

Row 1, Column 1
72 columns
8 Rows
A
B
C
D
E
F
G
H
I
Row 1, Column 1
76 columns
10 Rows
Row 3, Column 4
A
B
C
Row 13, Column 2

Figure PC-2. *How windows are positioned on the physical console.*

All positions and sizes refer to the *contents* of the window. The border is extra.

The Window Manager

CCP/M-86 has a program called the *window manager* which lets you change windows interactively. We're going to take time out from studying the properties of windows themselves to learn how to use the window manager, because the window manager will make it much easier for you to experiment with window definitions.

You load the window manager by running the WMENU command. Run WMENU now:

```
B>wmenu↵
15:32:40 B:WMENU.CMD
Window Manager installed.
B>
```

Notice the word `Win` that appears on the status line, next to the printer number. This tells you that the window manager is running.

Once the window manager is running, you can invoke it by entering the control character command `^+`. *You must use the* `+` *key to the right of the numeric keypad, not the one near the* `P` *key.* You can invoke the window manager at any time, even while running another program.

Enter `^+` now. The normal CCP/M-86 status line is replaced by the window manager's status line:

```
N=0: Place Size Scroll Tracking Display Color Write Abort [ESC]->Exit
```

As long as this status line is on the screen, the window manager is in control. Any input you type will go to the window manager, not to the command line processor or the program you are running.

The status line item `N=0:` means that virtual console 0 is in the foreground, and also that the window manager is letting you work on virtual console 0's window. You could work on another console's window by putting another console in the foreground, either before or after invoking the window manager. Enter `^1` now to confirm that this is so. Then return to virtual console 0 by entering `^0`.

The words from `Place` through `Abort` are the window manager's options — the things you can tell it to do. Pressing the Return key makes the window manager do the thing associated with the option inside the reverse video block. You tell the video manager to do different things by moving the reverse video block to different options with the left and right cursor movement keys before you press Return.

The `Place` option defines the position (the place) of the window's upper left corner on the physical screen. In other words, it performs the same function as the WINDOW command's PROW and PCOL parameters.

Press Return now to select the `Place` option. The window manager replaces its original status line with this one:

```
WINDOW CHANGE N=0 PRow=01,PCol=01
```

(Pressing ↑,↓,→,← places window.)

Now you can move the window round the screen by pressing your keyboard's cursor control keys. The ↑ key moves the window up one row, the ↓ key moves it down, and so on.

Try moving the window one step up, down, left and right. Notice how the values of PROW and PCOL in the status line change to agree with the window's position.

To leave the `Place` option and return to the window manager's status line, press your Escape key. In general, you press Return to enter one of the window manager's options, and Escape to return to the status line.

Press the → key once, then press Return, to select the `Size` option. `Size` defines the size of the window. In other words, it performs the same function as the WINDOW command's NROWS and NCOLS parameters. It displays the following status line:

```
WINDOW CHANGE N=0 NRows=08,NCols=72
```

(Pressing ↑,↓,→,← places window.)

Now you can change the window's size with the cursor control keys. Try decreasing the height and width of the window, then returning them to their original values. The values of NROWS and NCOLS in the status line change to agree with the window's size. When you are done, press Escape to return to the window manager's status line.

Select the `Scroll` item. `Scroll` defines the position of the upper left corner of the window on the virtual screen. In other words, it performs the same function as the WINDOW command's VROW and VCOL parameters. It displays this status line:

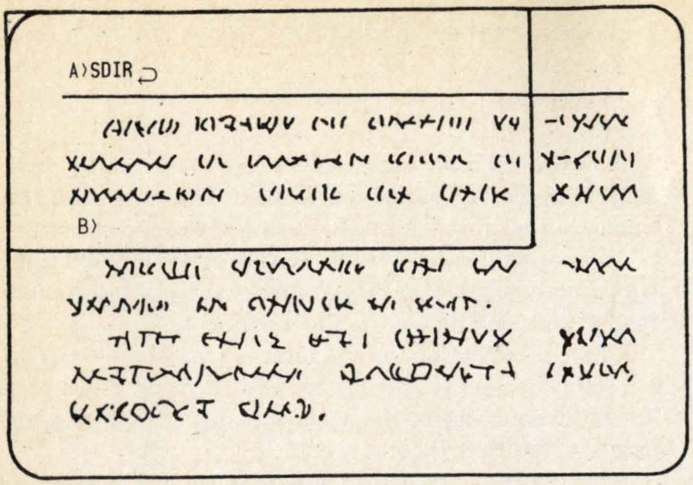
```
WINDOW CHANGE N=0 VRow=17,VCol=1
```

(Pressing ↑,↓,→,← places window.)

Notice that the value of VROW is not the value you entered. That's because you've run several commands on this console, which have displayed many lines of output on the virtual screen. In order to keep the cursor within the window, CCP/M-86 had to let the window move down until its last line was on the last line of the virtual screen (see figure PC-3). As the last line of the window moved down the virtual screen, the first line moved, too.

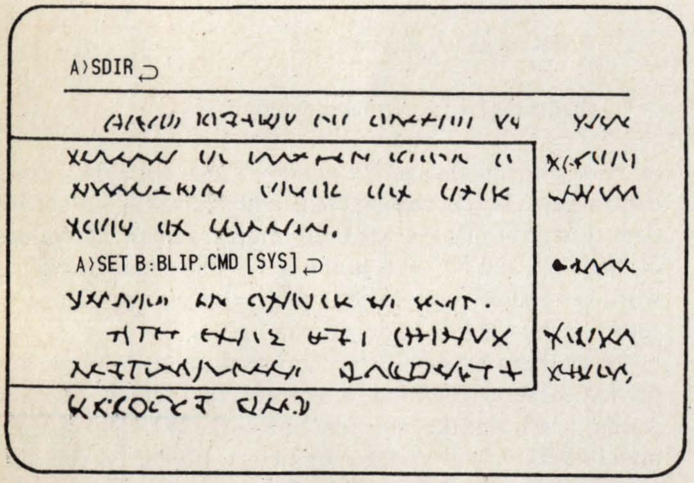
WINDOW won't let you increase the value of VROW, because that would bring rows that don't exist yet into the window. It also won't let you decrease VROW, which would push the cursor out of the window, or decrease VCOL, which would bring non-existent columns into the window. You can increase VCOL, though, by pressing the `->` key. Try that. Once you've increased VCOL, you can decrease it back to 1 (but not below).

Press Escape to return to the window manager's status line. Then press Escape again to leave the window manager



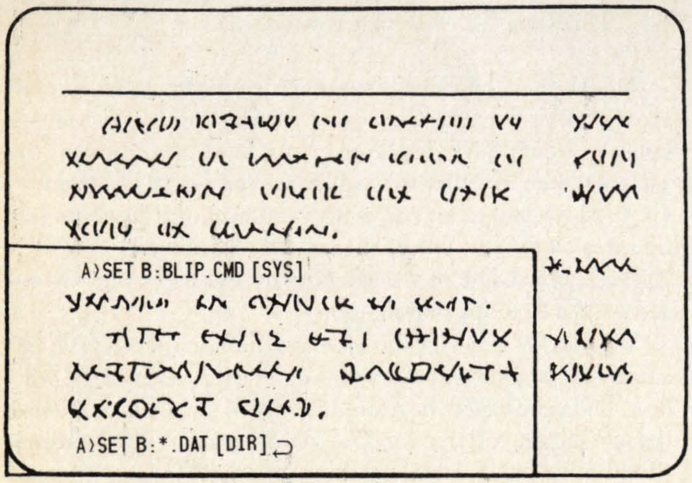
```
A>SDIR
B>
```

When you define the window, you place its top line at the top line of the virtual screen.



```
A>SDIR
A>SET B:BLIP.CMD [SYS]
```

As you run commands, CCP/M-86 lets the window move down the virtual console to keep the cursor displayed in the window.



```
A>SET B:BLIP.CMD [SYS]
A>SET B:*.DAT [DIR]
```

The window keeps moving down until its last line is on the last line of the virtual screen.

Figure PC-3. *Why the value of VROW is not the one you entered — you've run several commands which displayed many lines of output, moving the window down to see the last line.*

and return to whatever this virtual console was doing when you invoked the window manager.

Brief Summary

You start the window manager with the WMENU command. Once you've started the window manager, you invoke it with ^+. Use the + key to the right of the numeric keypad. You can invoke the window manager at any time, even while a program is running.

The window manager lets you manipulate the foreground console's window. You can change the foreground console in the usual way, before or after invoking the window manager.

To select any of the window manager's options, move the cursor over the option's name with the ← and → keys, then press Return. To return to the window manager's status line, press Escape.

The `Place` option lets you change the window's place on the physical screen (PROW and PCOL).

The `Size` option lets you change the window's size (NROWS and NCOLS).

The `Scroll` option lets you change the window's upper left corner position on the virtual screen (VROW and VCOL).

To leave the window manager, return to its status line with Escape and press Escape again.

Some Further Windowing Adventures

Have you wondered what would happen if you made two windows occupy the same part of the physical screen? Let's find out.

Invoke the window manager again by entering ^+. Select the `Size` option and press Return. Now press the ↓ key to increase the height of window 0.

As window 0's lower border moves down, it overlays window 1. If you move it down far enough it goes right below the bottom of window 1, so that only window 1's left and right edges remain visible.

Now type `^1` and see what CCP/M-86 does to the windows. It puts console 1 in the foreground, and it also moves window 1 on top of window 0!

All CCP/M-86 windows behave this way. You may think of the windows as a stack of cards. When a console is put in the foreground, its window is moved to the top of the stack. The other consoles' windows stay where they were.

Let's expand window 1 until it fills the screen. Go back to the window manager's status line and select `Place`; decrease both PROW and PCOL to 2. Now the upper left corner of the window's border is in the upper left corner of the physical screen. Go to the `Size` option again; increase NROWS to 22 and NCOLS to 78. Now the lower right corner of the window's border is in the lower right corner of the physical screen. Window 1 covers window 0 completely.

Switch back to console 0 to put window 0 on top of the "stack." It's still there, even though it was covered. Switch back to console 1.

Now use the window manager's `Place` option to decrease PROW and PCOL to 1. The upper left corner of the window has been moved to the upper left corner of the screen, and the top and left borders of the window have disappeared completely.

Use the `Size` option to increase NROWS to 24 and NCOLS to 80. Now window 1 fills the whole screen, and all of the window's borders have disappeared.

The display should look familiar. It's just what you'd see if you put virtual console 1 in the foreground without defining any windows at all. In fact, you've just returned window 1 to the state it was in before you entered the WINDOW commands.

If you give window 0 the same treatment you've given window 1, CCP/M-86 will behave exactly as it did before you started this section. Whichever console you put in the foreground, CCP/M-86 will fill the physical screen with that console's virtual screen.

If you want to demonstrate this, reboot your PC, run WMENU, invoke the window manager, and inspect any console's window specifications. You'll find they have the same values you've just set for window 1: PROW=1, PCOL=1, VROW=1, VCOL=1, NROWS=24, NCOLS=80. Then if you want, you can "create" a window by changing these values so that the window's borders become visible.

Now you can understand the origin of the extra text that you saw outside both windows when you defined the windows. The extra text is the contents of window 2, which you uncovered when you reduced the dimensions of windows 0 and 1.

As you can see, it's inaccurate to speak of "creating" a window. All the windows are there, all the time. You didn't notice them before because the one that was "on top" filled the physical screen, pushing its own borders off the edges of the screen and covering the other windows. That's why the WINDOW command's first parameter is CHANGE rather than CREATE. You really can't create windows. All you can do — all you need to do — is change them.

The Tracking Option: Keeping the Cursor In the Window

The window manager's `Tracking` option controls whether CCP/M-86 will permit a window to be positioned on its virtual console so that the cursor is not on a row in the window.

Remember your introduction to the `Scroll` option? You found that CCP/M-86 had moved window 0 down until its first line looked onto the 17th line of virtual console 0 (*i.e.*, `VROW=17`). It did this to keep the line containing the cursor within the window while the cursor moved down to the 24th and last line of the virtual console. Furthermore, CCP/M-86 would not let you decrease the value of VROW because doing so would leave the cursor's line outside the window.

CCP/M-86 behaved this way because window 0's `Tracking` option was set to its default value, `Row`. That is, the window was tracking (following) the row containing the cursor.

The `Tracking` option has a second value, called `No`. When `Tracking` is set to `No`, the window does not track the row containing the cursor.

Invoke the window manager now and select the `Tracking` option. Change its value from `TRACKING=ROW` to `TRACKING=NO` by pressing the ↑ or ↓ key, then press Escape to leave `Tracking`. Select the `Scroll` option and try to decrease the value of VROW so that the line containing the cursor is left outside the window. Now CCP/M-86 lets you do it.

Notice the precise function of `TRACKING=ROW`. It keeps some portion of the *line containing the cursor* in the window. It does not keep the cursor in the window; the cursor is free to be out of the window on the left or right side. This means that a program can display long lines in a narrow window, and each line will just be cut off at the window's edges. The contents of the window won't slide back and forth to keep the cursor in view as each line is displayed.

The Display Option

The window manager's `Display` option controls what type of display (Monochrome Display or color/graphics monitor) a window appears on. It defaults to the type of display your computer uses to boot. If your computer is equipped with a display of each type, you can use this option to put windows on both displays.

The `Display` option has two values: `DISPLAY=B&W` (for a Monochrome Display) and `DISPLAY=COLOR` (for a monochrome or color graphics monitor). Once you have selected the option, you switch it from one value to the other by pressing the ↑ or the ↓ key.

For example, suppose you have a display of each type, and your computer uses the Monochrome Display when you boot it. You could view all of windows 0 and 1 simultaneously by changing one of them from `DISPLAY=B&W` to `DISPLAY=COLOR`.

Note that `DISPLAY=B&W` refers only to the IBM Monochrome Display, and `DISPLAY=COLOR` refers to a monitor of any type: color or monochrome. These two option values really refer to the IBM Monochrome Display Adapter and the Color/Graphics Display Adapter, regardless of the type of display attached to either Adapter.

The Color Option

On a color monitor, the window manager's `Color` option controls the colors of the characters and background in a window. On a Monochrome Display, `Color` controls whether characters displayed in a window are presented in reverse video or underlined.

The `Color` option lets you distinguish one window from another by color. For example, if you define a small window to display the status of a long-running program while you work on another virtual console, you might give the small window a contrasting color to make it easy to find on the screen. Color can greatly enhance the legibility of your window displays if you use it judiciously.

When you select the `Color` option, the window manager presents this status line:

```
WINDOW CHANGE N=0 FG=White, BG=Black
```

(Pressing ↑,↓,→,← changes colors.)

`FG` specifies the color used for the foreground (*i.e.*, for characters). `BG` specifies the color used for the background. You shift the reverse video block from `FG` to `BG` by pressing the ← or → key; you change the color in the reverse video block by pressing ↑ or ↓ key.

For a color monitor, the meanings of the colors are obvious. All combinations are meaningful, except characters will become invisible if you make `FG` and `BG` the same color.

For a Monochrome Display, only the following combinations are meaningful:

`FG=WHITE, BG=BLACK:` normal video.

`FG=BLACK, BG=WHITE:` reverse video.

`FG=BLUE, BG=BLACK:` all characters underlined (including spaces).

For a monochrome monitor all combinations are meaningful, but colors will be represented by shades of grey, most of which give poor legibility. It is usually best to limit windows to `FG=WHITE, BG=BLACK` (normal video) and `FG=BLACK, BG=WHITE` (reverse video).

The `Display` option cannot copy or move the status line to the other display. This is because the status line is not part of any virtual console; nor can it be included in any window.

Introducing Full Mode

It is sometimes useful to get a look at the foreground console's entire display while you're working with several consoles shown in windows. Conversely, it is sometimes useful to get a look at several consoles shown in windows while you're working with the foreground console's entire virtual screen.

CCP/M-86 lets you do either of these things with *full mode*. Full mode simply displays the forground console's entire virtual screen on the physical console, regardless of how the windows are defined.

You invoke full mode by entering Control-Del (Control and Del keys). You leave full mode by entering Control-Del again. You can invoke and leave full mode while entering a CCP/M-86 command, while running a program, or while using the window manager.

For example, suppose you were using a word processor on virtual console 0 while a long-running PRINT command ran on console 1. You could define a one-row window for monitoring PRINT.

If something went wrong with PRINT, you might see several lines of error messages go past its window. To see what happened you could put console 1 in the foreground with `^1`, then invoke full mode with Control-Del. When you'd fixed the problem you could enter Control-Del again to leave full mode, then enter `^0` to put console 0 back in the foreground.

Or suppose you wanted to check on virtual console 1 occasionally, but you didn't want console 1 to be visible through a window all the time. You could define console 1's window as in the first example, but then invoke full mode before starting your work. Every so often you could leave full mode to check the status of console 1 without losing track of what you're doing in console 0. If all was well, you could invoke full mode again and proceed.

Writing Displayed Data To a File

The CCP/M-86 window manager can record the contents of a window or the contents of a whole virtual screen in a file. This feature has many uses, including:

- Printing data that a program only displays on the screen. (Once you record the screen in a file, you can print it.)
- Editing the output of a program before you print it.
- Incorporating the displayed output of a program into a document file.
- Using the displayed output of one program as input to another.
- Recording puzzling behavior exhibited by CCP/M-86 or a program for an experienced person to see at a later time.

As we mentioned at the start of the section on windows, recording the contents of the display in a file is an easy way to transfer data from one virtual console to another. For example, you could use a data retrieval program to display some financial results on one virtual console, record the display in a file, switch consoles, and read the file into a document that you are writing with a word processor.

Recording a Window In a File

To record the contents of a window in a file, invoke the window manager and select the `Write` option. The window manager displays a status line like this:

```
WINDOW WRITE N=0 Type=W,File=B:WINDOW0.TXT
```

(Pressing ↑, ↓ changes type.)

`N=0` means that console 0 is in the foreground. `Type=W` means that the window manager will record the contents of window 0 in a file. `File=B:WINDOW0.TXT` gives the name of the file the window manager will create. The window manager creates the file in the current user area on the same disk that holds virtual console buffer files. The `0` in the file name represents window 0; if you record the contents of window 1 the window manager will create a file named WINDOW1.TXT, and so forth.

Press the Return key to record the contents of window 0 in a file named B:WINDOW0.TXT and return to the window manager's status line. You can also return to the status line without recording the contents of window 0 in a file.

Put virtual console 0 in the foreground and press Return. Then press Escape to leave the window manager. Type the file WINDOW0.TXT. It should contain a copy of what was in window 0 when you recorded it with the `Window` option.

The next time you record window 0 in a file in your current user area, the window manager will replace this file with a new one of the same name. If you want to preserve this file, rename it now.

Recording a Virtual Screen In a File

You can change the behavior of the `Write` option by pressing either the ↑ or the ↓ key. Either key rotates the status line through the following displays:

```
WINDOW WRITE N=0 Type=W,File=B:WINDOW0.TXT
```

(Pressing ↑, ↓ changes type.)

```
WINDOW WRITE N=0 Type=C,File=B:CONSOLE0.TXT
```

(Pressing ↑, ↓ changes type.)

```
WINDOW WRITE N=0 Type=S,File=B:SETUP0.TXT
```

(Pressing ↑, ↓ changes type.)

When the window manager is displaying the second status line shown above, pressing Return will record the entire contents of virtual console 0's virtual screen — not just the part revealed by window 0 — in a file. Notice that the window manager uses a different file name, containing the word CONSOLE instead of WINDOW, to record an entire console.

Recording a Window Setup In a File

When the window manager is displaying the `Write` option's third status line, pressing Return records the current definitions of all the windows in a file named WSETUP.SUB. The definitions are recorded in the form of a series of WINDOW commands that will reproduce the current window definitions when they are run.

Once you've set up windows the way you want them you can record their definitions in a file, rename the file to preserve it, and recreate the windows later by simply running the file with SUBMIT.

Write the current window definitions to WSETUP.SUB now. Leave the window manager and rename the file to preserve it. For example, you might name it EXAMPLE.SUB.

Now reboot CCP/M-86. When you get the command line prompt, enter:

```
B>submit example↵
```

(Use whatever filename you gave the file). CCP/M-86 runs the WINDOW commands in the file, recreating the window definitions that were in effect when you created WSETUP.SUB.

Removing the Window Manager: The Abort Option

The window manager is in your computer's RAM as long as the word `Win` is present in the status line. This is convenient for manipulating the windows and writing them to files, but it has certain drawbacks.

One drawback of keeping the window manager in RAM is that it slows down the operation of many programs. The window manager increases the time CCP/M-86 requires to perform its display operations, and can have a significant impact on programs that use the display heavily, such as word processors.

Another drawback is that the window manager occupies RAM that could otherwise be used by application programs. This may make certain programs run slower, or reduce their data handling capacity, or prevent them from running at all.

You can remove the window manager from RAM by invoking it and selecting its `Abort` option. The window manager presents a status line like this one:

```
N=0:
```

(Press Return to abort WMENU, Escape to go back to previous menu)

Now press Return to remove the window manager from RAM and return to CCP/M-86.

Once the window manager has been removed you cannot invoke it with `^+`; nor can you invoke full mode with Control-Del. You can still switch consoles with `^0`, `^1`, and so forth, just as you could before you ran WMENU.

Caution: when you enter Control-Del, avoid pressing the Alt key, which will make your PC try to reboot CCP/M-86!

First parameter	Other parameters	Specifies what
`Change`	`Number=n` *	Window to be changed.
	`PRow=n`	Row on the physical screen to hold the first row of the window.
	`RCol=n`	Column on the physical screen to hold the first column of the window.
	`NRows=n`	Number of rows in the window.
	`NCols=n`	Number of columns in the window.
	`VRow=n`	Row on virtual screen to appear at the top of the window.
	`VCol=n`	Column on virtual screen to appear in the left-most column of the window.
	`Tracking=x`	`TRACKING=ROW` or `TRACKING=NO`.
	`Display=x`	`DISPLAY=B&W` or DISPLAY=COLOR.
	`FGcolor=x`	Foreground color; may be `WHITE`, `BLACK`, `BLUE`, `GREEN`, `CYAN`, `RED`, `MAGENTA`, or `YELLOW`.
	`BGcolor=x`	Background color; same options as `FGcolor`.
`Top`	`Number=n` *	Puts virtual console `n` in the foreground, putting window `n` "on top" of the stack of windows.
`Full`	`Number=n` *	Puts virtual console `n` into full mode, but does *not* put the console in the foreground.
`Write`	`Number=n` *	Makes WINDOW write the contents of the virtual console `n` or window `n` to a file.
	`TYpe=x` *	`TYPE=C` writes the console; `TYPE=W` writes the screen. (You cannot write the window definitions with WINDOW.)
	`FIle=name` *	Specifies the name of the file.
`View`	(none)	Displays window definitions in tabular form.

Table PC-1
The WINDOW Command's Parameters

In each parameter, capitalized letters indicate the shortest valid abbreviation for the parameter name.

* - indicates a required parameter. Omitting any other parameter leaves the corresponding value unchanged.

Back To the WINDOW Command

We introduced windows by entering some WINDOW commands, then we abandoned WINDOW for the window manager, which makes it much easier to experiment with window definitions. Now let's come back to the WINDOW command.

Look at the WINDOW commands in the set-up file you just created. These WINDOW commands illustrate a number of facts:

- All of WINDOW's parameter names may be abbreviated to as few as two characters, and many of them may be abbreviated to one character. Table L-10 shows the shortest valid abbreviation for each parameter name in capital letters.
- WINDOW has a parameter for each of a window's variable characteristics. Everything that the window manager can do to the window definitions, WINDOW can do as well.
- The WINDOW commands in WSETUP.SUB use spaces to separate the first parameter from the second, and commas to separate all following parameters. WINDOW lets you use spaces or commas to separate any two parameters.

There are a couple of more important facts about WINDOW that the set-up file doesn't illustrate:

- The first parameter (CHANGE in the examples you've seen so far) specifies window's overall function. The following parameters specify precisely what WINDOW is to do.

- The following parameters may be entered in any order. Most of them are optional, and if one is omitted, WINDOW will not change the value it is meant to set.

More Things WINDOW Can Do

The WINDOW command can do most of the things the window manager can do, such as switch foreground consoles and record displays in files. For example, to put virtual console 2 in the foreground, you could enter:

```
B>window top number=2 ↵
```

To record the contents of console 2 in a file, you could enter:

```
B>window write number=2 type=c file=b:contents.vc2 ↵
```

WINDOW lets you do some things that the window manager does not. For example, WINDOW with the WRITE parameter lets you control the name of the file you write, which the window manager does not let you do.

Table PC-1 summarizes all of WINDOW's capabilities.

Programs That Don't Respect Windows

Some application programs don't respect windows. For the sake of efficiency, they write their display output directly to the physical screen, not to their console's virtual screen. Also, no program respects windows while displaying graphics on a monitor.

If you run a program that doesn't respect windows, any windows you defined before running the program will be wiped out. Furthermore, CCP/M-86 won't know the windows are gone. If you switch to another console, CCP/M-86 will restore or update the parts of the screen that it thinks have been uncovered, ignoring the parts that it thinks have not changed. This will produce a display consisting of unusable fragments of various windows.

There are three ways to deal with such a program. The first way is not to define windows at all when you are running that program.

The second way is to re-install the program so that it respects windows. Some programs permit this and others do not. Even if a program permits it, the re-installed program will run more slowly whether you are using windows with it or not. This loss of speed may or may not be acceptable, depending on the design of the program and your own needs.

The third way is to run the program only in full mode, where the fact that it displays its output directly on the physical screen is not signficant. To look at the window display while running such a program, simply leave full mode. Don't enter any commands to the program until you re-invoke full mode. You may switch consoles without leaving full mode.

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The Meaning of Concurrency .... Page 24

Concurrent CP/M-86
and MP/M-86 Tutorial .... Page 50

CP/M-86 and MP/M-86 for CompuPro Systems.

This section contains specific information relating to the accompanying articles in this issue: "The Meaning of Concurrency" and the "Concurrent CP/M-86 and MP/M-86" tutorial, both by Jonathan Sachs.

This section is adapted from *The Osborne/McGraw-Hill Guide to CP/M-86* by Jonathan Sachs, © 1984 by Osborne/McGraw-Hill, Inc. CP/M-86 and MP/M-86, when functioning in exactly the same way, is described as "CP/M;" where they differ, the names CP/M-86 and MP/M-86 are used.

CompuPro's versions of CP/M-86 (called CP/M 8-16) and MP/M-86 (called MP/M 8-16) can run both eight-bit CP/M-80 software and sixteen-bit CP/M-86 software. A version of Concurrent CP/M-86 for CompuPro computers is in development.

Searching For Commands

If you're using CompuPro's CP/M 8-16 or MP/M 8-16 system, it looks for a CP/M-80 (eight-bit) ".COM" file if it cannot find a regular CP/M-86 ".CMD" file. After searching for a ".CMD" file on all the disks where generic versions of CP/M would search, it searches the same disks, in the same order, for a ".COM" file.

If you're using CP/M 8-16, CompuPro performs an additional search before telling you that it can't find the command. It searches user 0 of disk A for a ".CMD" file or ".COM" file with the SYS attribute. (Some older versions of CP/M 8-16 search only for a ".COM" file.)

How To Create a SUBMIT File

If you're using one of CompuPro's 8-16 systems, you cannot run a CP/M-80 program (a ".COM" file) from a SUBMIT file simply by entering its name in the file as you would enter it on a command line. SUBMIT cannot find a ".COM" file automatically, as the CP/M command interpreter can.

To run an 8-bit program from a SUBMIT file, enter its name as a parameter of the SW! command. For example, if DOGHOUSE.COM is an eight-bit CP/M program, and if you can run the following command line on your system:

```
A>doghouse example.txt[q]↵
```

Then you can also put the following in a ".SUB" file and run it using SUBMIT:

```
sw! doghouse example.txt[q]
```

In all of CompuPro's 8-16 operating systems, each system disk must hold a copy of the file SW!.CMD. CP/M uses this file to switch back and forth between the 8- and 16-bit CPU's.

If your CompuPro has only an 8088 or an 8086 CPU, you cannot execute 8-bit programs, and your disks should not contain SW!.CMD.

Concurrent Operations in MP/M 8-16

See the section in the Concurrent CP/M-86 and MP/M-86 tutorial on "Concurrent Operations in MP/M-86." The only difference is CompuPro's useful WHO utility.

You can tell who is logged on the system by running WHO:

```
A>who↵
```

WHO lists the account name and console number of each user that is logged on. WHO is a recent addition. Users of MP/M-86 systems distributed before February of 1984 won't have it.

How To Escape From the Deadly Embrace

If you're using a CompuPro 10, you cannot use the ABORT command to abort a CP/M-80 program (one whose filetype is ".COM"). Instead, you must use the ABORT8 command. You run ABORT8 just as you would run ABORT.

FOG

The **FIRST OSBORNE GROUP (FOG)** has been formed as a User's Group for persons using or interested in portable computers and/or the CP/M disk operating system with related software. In May of 1984, there was nearly 12,000 members from around the world. Most attend local group meetings at over 300 locations.

Computer systems owned or used by members include the Osborne 1 (single and double density), the Osborne Executive 1, all models of the Morrow MicroDecision, the Zorba, all models of the KayPro, several MicroMates, and many more. Special interest groups organized to augment a network of local group meetings include dBase II, Ham radio operators, Personal Pearl.

FOG was started in October of 1981 by a small band of early buyers of the Osborne 1. The primary purpose was to organize a library of public domain software to run on the Osborne 1. A newsletter was quickly started to act as a focal point for the group's activities. The large number of excellent contributions to both the library and the newsletter has produced a library of 200 disks (as of April, 1984) and a nicely typeset (56 or more pages) monthly publication. All back issues of the ***FOGHORN*** are available for a nominal fee which includes shipping in the U.S. Contributions are currently being solicited for bulletin board systems in addition to the three currently in operation. All systems accept both 300 baud and 1200 baud. Phone numbers for existing systems are:

System #1 — Daly City, CA	(415) 755-2030
System #2 — Vancouver, BC	(604) 596-0314
System #3 — Daly City, CA	(415) 992-8542

While the meetings are organized on a local basis, over 100 of these local groups have joined the FOG network, thus increasing the sharing of information, tips, problems and so on. Those local groups which opt to formally join the FOG network receive a portion of local member dues to assist with the cost of maintaining a local copy of the disk library.

The FOG library is currently maintained on the Osborne 1 single density format but separate libraries are being established for the other computer formats. The library files are carefully screened and divided into category types (utilities, games, applications, and computer languages are the four major categories). Programs which contain run or other errors are put into the hacker section so interested members can fix them and resubmit for inclusion in the correct section. Items which do not fit into one of these categories are in the miscellaneous section. A catalog and descriptions of all the discs is maintained in the library section.

Dues in FOG are $24.00 per year. This entitles each member to a copy of the ***FOGHORN*** each month as well as access to the disk library. Local group meetings are open to the public without charge although most restrict access to the library to the membership. The FOG library contains only public domain software. Piracy (the copying of proprietary software) is strongly condemned.

In the United States, the ***FOGHORN*** is normally mailed by non-profit bulk mail. (FOG is a corporation in the state of California and has obtained its non-profit, tax exempt status from both the state and federal governments.) For those members who live out of the country or who prefer first class delivery of their ***FOGHORN***, additional postage must be added to the annual dues. See the chart below for details.

If you are interested in joining a self-help organization to increase you knowledge and the use of your computer, use the application below (or a copy of it). Generally, memberships received at the FOG office prior to the 15th of the month are entered in time to receive the next month's ***FOGHORN***.

If you know of a local group which might be interested in joining the FOG network, please send all details (meeting dates and places, officers, and how interested local computer owners can join). We will send you an information packet on becoming an Affiliated Member Organization.

For your records, the address of FOG is P. O. Box 3474, Daly City, CA, 94015-0474. Please allow at least two months for the arrival of your first ***FOGHORN*** since bulk mail can take as much as nine weeks. (The post office says that it should only take about three week for non-profit bulk mail but some members on the East Coast have experienced longer delays.) A membership card will be processed within a week of the receipt of your dues.

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Concurrent CP/M-86 and MP/M-86 Files, Disks and Print Queues

A brief tutorial and reference guide to features of Concurrent CP/M-86 and MP/M-86 not found in generic CP/M-86. This first installment describes file attributes, system disk usage, concurrent printing and more.

This article refers to specific information in subsections devoted to the IBM PC, DEC Rainbow and CompuPro versions of Concurrent CP/M-86 and MP/M-86.

The Meaning of Concurrency .... **Page 24**
Concurrent CP/M-86:
on the DEC Rainbow .... **Page 34**
on the IBM PC .... **Page 37**
MP/M-86 on CompuPro .... **Page 48**

This article introduces Concurrent CP/M-86 and MP/M-86 file attributes, user areas, system operation, use of a printer, and concurrency. Future installments will cover password protection, time and date stamping of files, and using a memory disk.

In this article we refer to Concurrent CP/M-86 as CCP/M-86. The most recent version is under a new name: Concurrent DOS. However most people are using an older version which is described in this article. The latest features of Concurrent DOS will appear in a future installment.

We also use "CP/M" to stand for Concurrent CP/M-86, CP/M-86 *and* MP/M-86 when describing a rule that pertains to all three systems.

---

by Jonathan Sachs

Jonathan Sachs writes for several computer magazines. This material was adapted from a book titled *The Osborne/McGraw-Hill CP/M-86 User's Guide* by Jonathan Sachs, © 1984 by Osborne/McGraw-Hill, Inc.

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File Attributes

Every CP/M file may have several kinds of properties called *file attributes*. File attributes play an important role in helping you manage your file.

Typesetting Conventions

In this article we use `THIS typeface` to show exactly what you should type at your keyboard, with the special symbols ^ for the Control key (CTRL, CNTL or ALT on some keyboards), and ⮐ for the Return key (RET, CR or Carriage Return on some keyboards). We also use `This Typeface` to show messages displayed by the system or by programs.

Where noted, we use *italics* in reference sections along with `This typeface` to imply something you supply that is optional in the command. In such cases, `lower case in this face` implies something you supply that is required with the command, which is usually in `UPPER CASE`.

One important pair of file attributes are the DIR and SYS attributes. Every CP/M file has one or the other of these attributes.

The DIR attribute is appropriate for the data files that you create, modify and delete as you work. The SYS attribute is appropriate for files which you view as part of the operating system. System files usually include all of the ".CMD" files, and HELP.HLP (which contains the text displayed by the HELP command).

In Concurrent CP/M-86 and MP/M-86 you can see which files on a disk have what attributes by running the SDIR program, which is an enhanced version of the DIR command (the DIR command is also available). SDIR displays a column labelled `Attributes`, in which the word `Sys` appears opposite each SYS file, and `Dir` appears opposite each DIR file.

In all versions of CP/M-86 and MP/M-86, you may use the DIR command to list only files that have the DIR attribute. This is a convenient way to look at your data files and ignore the system files, which seldom or never change.

Read-Write & Read-Only Attributes

Another important pair of file attributes are the RW ("read-write") and RO ("read-only") attributes. An RW file can be read, modified or erased by a command. An RO file is protected so it can only be read.

You can tell whether a file has the RW or the RO attribute by running SDIR, which shows the RW or RO attribute in the `Attribute` column.

The RW attribute is appropriate for data files that you frequently change as you work. The RO attribute is for system files, and for data files that you seldom change and would like to protect from accidental change or erasure.

Changing File Attributes: SET

A CP/M file's "normal" attributes are DIR and RW. When you create a file with most CP/M commands, the file has these attributes.

In CCP/M-86 or MP/M-86, you change a file's attributes by running the SET command like this:

```
B>SET yourfile.txt[RO]↵          (for RO)

B>SET yourfile.txt[RW]↵          (for RW)

B>SET yourfile.txt[SYS]↵         (for SYS)

B>SET yourfile.txt[DIR] ↵        (for DIR)
```

Other File Attributes
(CCP/M-86 and MP/M-86)

CCP/M-86 and MP/M-86 recognize several other file attributes. We'll mention them briefly here; you'll encounter them again in later installments of this tutorial.

These file attributes do not come in pairs as DIR/SYS and RW/RO do. Each of them may be set or not set, independently of the others.

The *archive attribute* indicates that a file has been copied (archived) to another disk for safe keeping.

In CCP/M-86 and MP/M-86 there are four attributes named F1, F2, F3, and F4. MP/M-86 uses them to help run programs that were meant to be run under single-user versions of CP/M. In files other than ".CMD" files, and in CCP/M-86, they may be used for any purpose.

NOTE:

The square bracket that begins an option may, but need not, be preceded by a space. The command below is exactly the same as the one above:

```
B>set oops.doc [ro sys]↵
```

Useful SDIR Options

(CCP/M-86 and MP/M-86)

The SDIR command accepts several useful options.

The `[RW]`, `[RO]`, `[SYS]` and `[DIR]` options make SDIR list only files with the RW, RO, SYS, and DIR attributes. For example, to list only files with the SYS attribute, you would enter:

```
B>sdir [sys]↵
```

You can make an SDIR listing more selective by combining two or more options in one command. For example, to list only files with both of the attributes SYS and RO, you would enter:

```
B>sdir [sys ro]↵
```

You can make SDIR list files that match any of up to ten file names by entering an SDIR command with several parameters. For example, to list the files PIP.CMD, STARTUP.0 and CCPM.SYS, you would enter:

```
B>sdir pip.cmd startup.0 ccpm.sys↵
```

Notice that SDIR produces a single, combined list with the file names in alphabetic order.

You can use the EXCLUDE option to make SDIR list all files that do *not* have specified file names. For example, to list all of the files on a disk except PIP.CMD, STARTUP.0 and

CCPM.SYS, you would enter:

```
B>sdir pip.cmd startup.U ccpm.sys [exclude]↵
```

You can use the SIZE option to make SDIR produce a directory display that shows only the name and size (in kilobytes) of each file. Figure 1 shows an example of the display produced by the SIZE option. This display is almost as compact as the DIR command's display, but often is as useful as a full SDIR display.

Familiarize yourself with SDIR's options by trying each of them on your computer. SDIR will accept any combination of options that makes sense. Try various combinations of options and make a note of the ones likely to be most useful to you.

User Areas

Every CP/M disk is divided into 16 *user areas*, which are numbered 0 through 15. At any time you can use files in only one user area. We'll call this area the *current user area*. When you change user areas, the change affects all of your disks; you can't be in different user areas on different disks at the same time.

If you're using CCP/M-86, you can organize your files by keeping different groups of files in different user areas. For example, you might keep your correspondence in user area 1, your bookkeeping files in user area 2, and so forth.

If you're using MP/M-86, you probably have been assigned one user area to do your work in. Different users (or, at least, users of different terminals) keep their files separate by storing them in different user areas.

A disk's user areas have no fixed size. You can store as much data as you want in each user area, so long as all the files on the disk do not exceed the disk's capacity.

Changing the Current User Area (CCP/M-86 Only)

When you boot CCP/M-86, it makes user area 0 the current user area.

To change the current user area, enter the USER command. For example, to make user area 1 the current user area, enter:

```
A>user 1↵

User Number = 1
1A>
```

Enter this command now, then enter SDIR. SDIR should display the message `NO FILE`. This is because your system disk currently has files only in user area 0.

Notice that after you enter USER 1, CCP/M-86 displays a "1" before the command prompt. This tells you what user area is the current one. Try entering:

```
1A>user 2↵

User Number = 2

2A>user 13↵

User Number = 13

13A>user 0↵
User Number = 0

A>
```

When the current user area is number 1 through 15, CCP/M-86 displays the number before the default drive name in its command prompt. When the current user area is number 0, CCP/M-86 displays the default drive name alone.

Changing the Current User Area (MP/M-86 Only)

When you start using MP/M-86, it assigns you to a particular user area. On some computers, the area it chooses is determined by the terminal you use; on others, it depends on your account name.

The user area MP/M-86 puts you in is "yours" (though perhaps to be shared with some other users). You normally will be expected stay in this user area, and if you run programs in another you may interfere with some other user's work. Changing user areas is occasionally necessary, though, and you should know how to do it.

To change the current user area, enter the USER command. For example, to make user area 1 the current user area, enter:

```
5A>user 1 ↵

User Number = 1

1A>
```

Notice that the number before the command line prompt changes when you change user areas. At all times it tells you what your current user area is.

Change back to your original user area before going on.

SHOW What User Areas Contain Files

To find out which of a disk's user areas contain files, run the the SHOW command with the `[USERS]` option:

```
A>show [users]↵                    (for the default drive)
```

```
A>show b:[users]↵
```

(for a named drive)

SHOW displays the number of the current user area, the numbers of user areas that contain files on this disk, and the number of files in each area:

```
A>show b:[users]↵

B: Active User :  1
B: Active Files:  0  1  8 13
B: # of files : 25  3 11  2

A>
```

(In MP/M-86 SHOW's output looks slightly different, but contains the same information.)

Once you know which user areas contain files, you can make each user area current with USER and examine the area's contents with DIR or SDIR.

Listing Another User Area's Directory

SDIR lets you list a disk's directory for one or more user areas other than the current area. Enter SDIR with the `[G]` ("get from user area") option. The directory is listed one user area at a time:

```
A>sdir [g1]↵
```

(This displays the default disk, area 1.)

```
A>sdir b:[g1 g13]↵
```

(This displays disk B, areas 1 and 13.)

The `[USER=]` option does the same thing:

```
A>sdir [user=g1]↵
```

(This displays the default disk, area 1.)

```
A>sdir b:[user=(1,13)]↵
```

(This displays disk B, areas 1 and 13.)

The `[USER=ALL]` option lists all the files in all the user areas on a disk:

```
A>sdir [user=all]↵
```

(This displays all user areas on default disk.)

```
A>sdir b:[user=all]↵
```

(This displays all user areas on disk B.)

How CP/M Searches For a Command

Not all CP/M commands are stored in ".CMD" files. Some are loaded into RAM when CP/M is booted, and remain there as long as CP/M is running. In CP/M-86, such commands are called *built-in commands*. In Concurrent CP/M-86 and MP/M-86, they are called *resident system processes* (RSPs).

In CP/M-86, USER, DIR, and ERA are built-in commands. Different versions of Concurrent CP/M-86 and MP/M-86 have different sets of RSPs. In most systems, though, USER is an RSP.

The SYS Attribute Revisited

All three varieties of CP/M look for a command file in user area 0 if they can't find it in the current user area. They will find the command file only if it has the SYS attribute, though. This is the SYS attribute's real purpose: it lets you store a single copy of a command file in user area 0 and run it from any user area. Thus it's a good idea to store all of your generally useful command files in user area 0 and give them the SYS attribute.

The System Disk

In Concurrent CP/M-86 and MP/M-86, the term *system disk* has a special meaning. It is the disk on a particular drive where CP/M searches for commands that it can't find elsewhere.

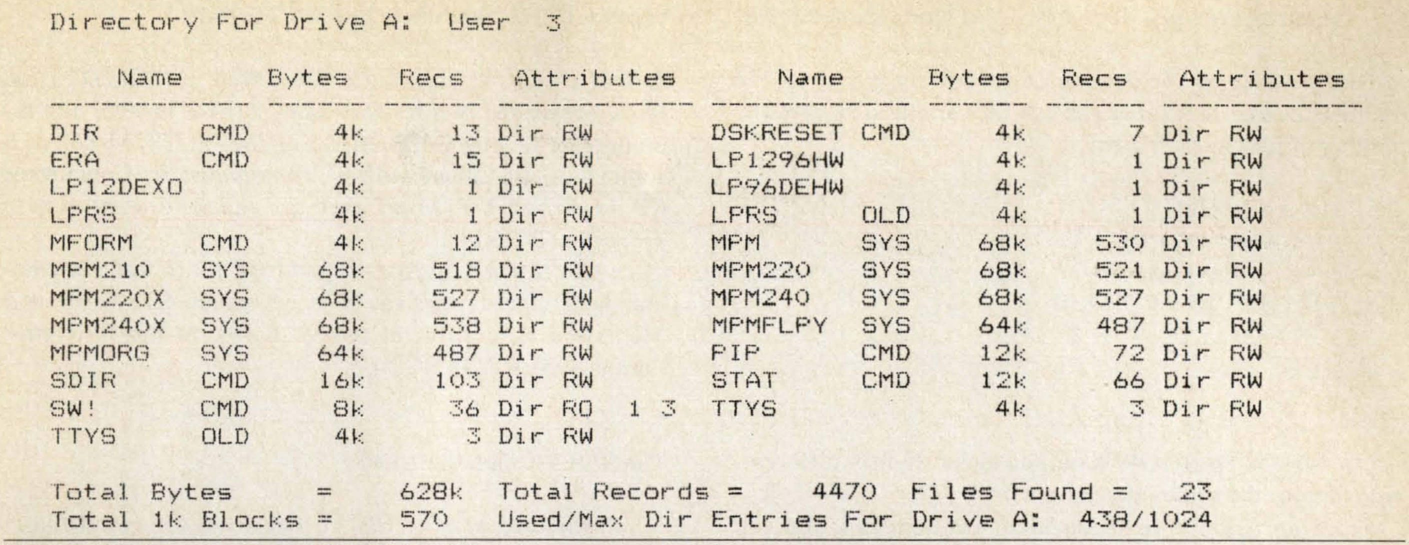
On most computers, the system disk is the same as the default disk that Concurrent CP/M-86 selects for you when you boot. The default disk and the system disk may be changed independently, though. Sometimes it's useful to make them different. Then you can fetch commands from either disk without having to know what commands are stored on which.

NOTE:
Check the IBM PC, CompuPro and DEC Rainbow subsections for the differences in how these computers treat the system disk and the search methods used.

How CP/M-86 Searches For a Command

To compare the generic CP/M search method with Concurrent CP/M-86 and MP/M-86, here's a quick description of the generic method. When you enter a command, CP/M-86 looks for it like this:

1. First it searches its list of built-in commands.
2. Next it searches the current user area of the specified disk, or of the default disk if you specified none. It looks for a file with a filename the same as the command name, and a filetype of ".CMD".



```
Directory For Drive A:  User  3

    Name        Bytes   Recs   Attributes       Name        Bytes   Recs   Attributes
------------   ------  ------  ------------  ------------   ------  ------  ------------
DIR      CMD      4k      13 Dir RW          DSKRESET CMD      4k       7 Dir RW
ERA      CMD      4k      15 Dir RW          LP1296HW          4k       1 Dir RW
LP12DEXO          4k       1 Dir RW          LP96DEHW          4k       1 Dir RW
LPRS              4k       1 Dir RW          LPRS     OLD      4k       1 Dir RW
MFORM    CMD      4k      12 Dir RW          MPM      SYS     68k     530 Dir RW
MPM210   SYS     68k     518 Dir RW          MPM220   SYS     68k     521 Dir RW
MPM220X  SYS     68k     527 Dir RW          MPM240   SYS     68k     527 Dir RW
MPM240X  SYS     68k     538 Dir RW          MPMFLPY  SYS     64k     487 Dir RW
MPMORG   SYS     64k     487 Dir RW          PIP      CMD     12k      72 Dir RW
SDIR     CMD     16k     103 Dir RW          STAT     CMD     12k      66 Dir RW
SW!      CMD      8k      36 Dir RO   1 3    TTYS              4k       3 Dir RW
TTYS     OLD      4k       3 Dir RW

Total Bytes     =    628k  Total Records =    4470  Files Found =    23
Total 1k Blocks =    570   Used/Max Dir Entries For Drive A:   438/1024
```

Figure 1. *Display produced by SDIR with the SIZE option.*

3. Finally it searches user area 0 of the specified disk, or of the default disk if you specified none. It looks for a file file with a filename the same as the command name, a filetype of ".CMD", *and the SYS attribute.* If the file is present but doesn't have the SYS attribute, CP/M-86 will not find it.

If CP/M-86 finds the file in one of these steps, the remaining steps are not performed.

If CP/M-86 does not find the file in any of these steps, it displays the file name with a question mark after it, like this:

```
B>staf↵                    (An error; you meant STAT...)
STAF?
B>
```

If you often work in user areas other than area 0, you'll want to give all of your commonly used command files the SYS attribute. Then you can keep them in one place — user area 0 — and run them from any user area.

Searching For a Command: Concurrent CP/M-86 & MP/M-86

When you enter a command, Concurrent CP/M-86 or MP/M-86 looks for it in the following way:

1. First it searches its list of RSPs.

2. Next it searches the current user area of the specified disk, or of the default disk if you specified none. It looks for a file with a filename the same as the command name and the filetype ".CMD".

3. Next it searches user area 0 of the specified disk, or of the default disk if you specified none. It looks for a ".CMD" file with a filename the same as the command name, the filetype ".CMD", *and the SYS attribute.* If the file is present but does not have the SYS attribute, it will not be found.

4. If you entered a drive name with the command name, CP/M gives up the search here. If not, it searches the current user area of the system disk for a ".CMD" file with the SYS attribute.

5. Finally it searches user area 0 of the system disk for a ".CMD" file with the SYS attribute.

If CP/M finds the file in one of these steps, the remaining steps are not performed.

If CP/M does not find the file in any of these steps, it displays an error message like this one:

```
B>sdif↵                         (in Concurrent CP/M-86)
CP/M Error: Can't Find Command
Command = sdif
B>

3B>sdif↵                                  (in MP/M-86)
SDIF?
3B>
```

Check the CompuPro and DEC Rainbow subsections for the differences in search methods used in those computers.

Using SUBMIT

Concurrent CP/M-86 (CCP/M-86) and MP/M-86 have enhanced versions of the SUBMIT utility, and since the nature of "submit jobs" changes under concurrency and multiple-user operation, we describe how the SUBMIT utility differs from normal CP/M.

Terminating a SUBMIT Operation (CCP/M-86 Only)

To make CP/M stop processing a ".SUB" file, enter `^C`.

If you enter `^C` while CP/M is running a program from the ".SUB" file, CP/M terminates the program and proceeds to the next command in the ".SUB" file.

If you enter `^C` while CP/M is between programs in the ".SUB" file, CP/M terminates the SUBMIT operation immediately and presents its command prompt.

Terminating a SUBMIT Operation (MP/M-86 Only)

To make MP/M-86 stop processing a ".SUB" file, enter `^C`. If you enter `^C` while MP/M-86 is between commands, it terminates the submit file and gives you its command prompt. If you enter `^C` while MP/M-86 is running a command, it displays the prompt:

```
Terminate program (Y/N)?
```

For `program`, it substitutes the name of the program that is being run. If you respond with `N`, MP/M-86 allows the program to resume running. If you respond with `Y`, MP/M-86 terminates the program and displays the prompt:

```
Terminate subfile.SUB (Y/N)?
```

For `subfile`, MP/M-86 substitutes the filename of the ".SUB" file you are running. If you respond with `N`, MP/M-86 proceeds to the next command in the ".SUB" file, if any. If you respond with `Y`, MP/M-86 terminates the whole SUBMIT operation and gives you its command prompt.

How One ".SUB" File Can Run Another

Sometimes it is useful to create a ".SUB" file that runs another ".SUB" file. CP/M allows this, but it does not return to the first file when it finishes running the second.

For example, if you ran this ".SUB" file:

```
config p3 1200
sysdisk a:
sdir a:
submit b:extra
date set
```

And if the second ".SUB" file, EXTRA.SUB, contained this:

```
era b:*.bk?
era c:*.bk?
```

CP/M would run the following commands when you SUBMIT the first ".SUB" file:

```
config p3 1200
sysdisk a:
sdir a:
era b:*.bk?
era c:*.bk?
```

After finishing EXTRA.SUB, CP/M would give you its command prompt. It would not return to the first command file to run `DATE SET`.

In CCP/M-86 or MP/M-86 you can use the $INCLUDE command to include the contents of one ".SUB" file in another. In the example above, you would write the first ".SUB" file like this:

```
config p3 1200
sysdisk a:
sdir a:
$include b:extra
date set
```

CP/M then would perform as if the first ".SUB" file contained:

```
config p3 1200
sysdisk a:
sdir a:
era b:*.bk?
era c:*.bk?
date set
```

$INCLUDE is not truly a command. It is an instruction to SUBMIT to *substitute* the contents of the file EXTRA.SUB for the $INCLUDE line, in the same sense that a parameter symbol like $1 is an instruction to SUBMIT to substitute a parameter value. $INCLUDE is meaningful only in a ".SUB" file.

An $INCLUDE command may specify parameter values just as a SUBMIT command may. For example, if a file named CPYAP.SUB contained the following line:

```
$include cpysys a b
```

And if the file named CPYSYS.SUB looked like this:

```
pip $2:*.sys=$1:*.sys[rv]
set $2:*.sys[ro sys]
sdir $2:*.sys
```

SUBMIT would substitute the following commands for the $INCLUDE line when it processed CPYAP.SUB:

```
pip b:*.sys=a:*.sys[rv]
set b:*.sys[ro sys]
sdir b:*.sys
```

$GLOBAL and $LOCAL Commands (CCP/M-86 Only)

If you change the default drive within a ".SUB" file, the change ordinarily endures only while CCP/M-86 is running that file. When CCP/M-86 finishes running the file, it sets the default drive back to its original value.

Similarly, if you change the current user area with the USER command in a ".SUB" file, or assign LST to a printer with the PRINTER command in a ".SUB" file, that change endures only while CCP/M-86 is running that file. When

CCP/M-86 finishes running the file, it restores the original user area and LST assignment.

To make a permanent change to any of these properties, use the $GLOBAL command in the ".SUB" file before the commands that make the change. For example, to assign LST to printer 3 and make user area 5 the current user area, and make both changes permanent, you would run this ".SUB" file:

```
$global
printer 3
user 5
```

If you want to make a permanent change to one thing and a temporary change to another, you can terminate the effect $GLOBAL with $LOCAL. For example, this ".SUB" file would make a permanent change to the LST assignment, but a temporary change (limited to the ".SUB" file being run) to the user number:

```
$global
printer 3
$local
user 5
```

Like $INCLUDE, $GLOBAL and $LOCAL are instructions to SUBMIT, not true commands. They have meaning only in a ".SUB" file.

Restrictions On ".SUB" Files (CP/M-86 Only)

You cannot process a ".SUB" file that has:

- More than 125 characters in any line.
- More than 2048 characters total. (The total length of an ASCII file is the sum of the lengths of the lines, plus 2 characters per line, plus 1.)
- More than 128 lines.

These limits apply after parameter values have been substituted for parameter symbols.

You must not use the USER command to change the current user area in a ".SUB" file. This is because SUBMIT writes a working file named $$$.SUB to the disk and user area where the ".SUB" file itself is found. If the ".SUB" file changes the user area, CP/M can't find $$$.SUB any more, and can't finish running the ".SUB" file. What's more, if $$$.SUB is in user area 0 of your boot disk and you don't erase it, CP/M will try to finish running it the next time you boot!

Using Your Printer

CCP/M-86 and MP/M-86 associate a *printer number with each port* that could be attached to a printer. *If you're running CCP/M-86*, LST is assigned to printer number 0 when you boot. *If you're running MP/M-86*, LST is assigned to a printer number determined by your system manager.

The PRINTER Command

If your printer is attached to a different port, you can assign LST to the proper printer number by running the PRINTER command. For example, to assign LST to printer number 3:

```
B>printer 3↵
Printer Number = 3
```

To find out what the printer numbers mean on your computer, ask a person familiar with the computer or consult the computer's CCP/M-86 or MP/M-86 user's manual.

You can display the current assignment of LST by running PRINTER with no parameter:

```
B>printer↵
Printer Number=3
```

Printing Whatever Is Displayed On the Screen

A simple way to print information in CP/M is to make CP/M begin sending a copy of everything it displays on your screen to logical device LST. If LST is assigned to your printer, this will cause everything displayed on the screen to be printed at the same time.

To make CP/M begin copying its displayed output to LST, enter the control character command `^P`. Enter `^P` a second time to make CP/M stop printing what it displays. (Check the IBM PC subsection for differences in using your printer.)

If you're using MP/M-86, be sure no one else wants to use the printer, and the printer is at the top of a page, before you enter `^P`. Using `^P` can disrupt other users' work: your output may appear on the same sheet of paper as the last page of someone else's output, and if someone tries to use the printer while you are printing with `^P`, he or she cannot do so.

If your installation's customs don't allow you to use `^P` at all, it's no great loss; you'll soon learn another way of printing data in MP/M-86 that won't interfere with their work.

If you're using CCP/M-86, or MP/M-86 and you have the printer to yourself, make sure that the printer is turned on and ready for use. Then enter `^P` and run a few CP/M commands such as SDIR or STAT. CP/M should print everything on the printer that it displays on the screen. When you're done, enter `^P` again to make CP/M stop copying its displayed output to the printer.

The simplest way to print a text file is to enter ^P and then run the TYPE command:

```
A>^Ptype b:example.txt↵

                    (CP/M types the contents of the file.)

A>^P
```

Try this with one of the text files on your CP/M disk. Any file with a filetype of ".TXT", ".DOC", or ".SUB" should work.

When you print a text file with TYPE, the TYPE command is printed before the file. If you want to eliminate that, enter the first ^P at the *end* of the TYPE command, just before you press RETURN, or copy the file to LST with PIP:

```
A>pip lst:=b:example.txt ↵
A>
```

^P makes CP/M print its own displayed output, that of the generic CP/M commands, and that of most other programs that display output a line at a time. It does not make CP/M print the displayed output of most commands that "paint" information on the screen, such as the IBM PC's DSKMAINT or the DEC Rainbow's COPY.

Some things that might go wrong are summarized later. If CP/M displays the message `Printer busy`, it means that another user is using the printer. Wait until the printer is free and try again.

Printing the Contents Of the Screen

On some computers, CP/M-86 and MP/M-86 let you print the current contents of the screen at any time, even while you are running a program. This is a convenient way to print a small amount of information, or to make an accurate record of what is on the screen when your computer does something that puzzles you.

The screen printing feature works differently on different computers. See your computer's CP/M user's manual for more information. (See the DEC Rainbow subsection for that computer's information.)

To record the contents of the screen in a file you must have some knowledge of CCP/M-86's concurrency features. See the article on the "Meaning of Concurrency" for details.

Printing and Computing At the Same Time

Some versions of CP/M allow you to say "print this file," and then run other commands while CP/M prints the file for you. This ability is called *queuing*. It is useful because a large file can take a long time to print, and while it prints you may want to use your computer for other purposes.

The generic version of CP/M-86 does not have a queuing facility. Some versions of CP/M-86 have such a facility; check your computer's CP/M user's manual to see if your version of CP/M-86 has one. (See the IBM PC subsection for details about that computer.)

How To Queue a File With SPOOL (MP/M-86 Only)

You can queue a file for printing with the SPOOL command:

```
0A>spool example.txt↵
```

If the printer is not currently in use, MP/M-86 starts printing the file immediately. If the printer is in use, MP/M-86 queues the file and prints it when the printer is free.

SPOOL does not send a form feed to the printer before *or* after a file. To keep the printer's paper properly aligned, you should be sure that your file begins or ends with a form feed, or is an exact number of pages long. Your system manager or fellow users can tell you which of these techniques is customary at your installation. If none of them is customary, start every file with a form feed. As long as no one rolls the paper up by hand, that will ensure that your printed output starts at the top of a page.

You can queue two or more files at once by entering SPOOL with several parameters:

```
0A>spool example.txt,data.txt,example.sub↵
```

You can remove a file from the queue as long MP/M-86 has not yet started printing it. To remove a file from the queue, run SPOOL with the file's name and the `[DELETE]` option:

```
0A>spool example.sub[delete]↵
```

After MP/M-86 has started printing a file, you can make it stop by entering the STOPSPLR ("stop spooler") command:

```
0A>stopsplr↵
```

STOPSPLR removes *all unprinted files from the print queue, whether they were queued from your console or another one*. Thus you should use STOPSPLR *very carefully* to avoid wiping out other users' print requests!

Printing Data Directly In MP/M-86

MP/M-86 lets you print data directly (*e.g.*, by running a program that writes data to the LST: device, or by entering ^P), as well as through SPOOL. Direct printing can cause problems, though. It monopolizes the printer for as long as a program that prints directly is running, or for as long as ^P is in effect. For example, if one user tries to enter ^P while another is using the printer, MP/M-86 display the message `Printer busy`, and will ignore `^P`.

It's not always practical to use SPOOL, though. Many application programs such a word processors have their own "print" commands, which format the data as they print it. If you used SPOOL to print a file prepared by such a program, you would get poorly formatted output or nonsense.

Because of this, MP/M-86 shops tend to develop two different sets of customs for using printers. Some have "closed" printers, where users are expected to print only through SPOOL. Others have "open" printers, where users may print in whatever manner suits their needs.

Your system manager or your fellow users can tell you about your installation's customs for use of printers. If your printers are "open," you'll have to co-operate with the other users to prevent your printing tasks from interfering with theirs, or *vice versa*.

Some Things That Might Go Wrong

Your computer prints nonsense, prints nothing, or freezes when a file is queued.

See the list of things that might go wrong when a file is printed with `^P`.

The printer stops printing before the end of the file. Your computer may freeze.

The printer has run out of paper or ribbon, or has otherwise entered a non-ready state. Correct the problem and bring the printer back on line.

The printer does not print after you enter `^P`. *Your computer may freeze when you enter the next few characters after* `^P`.

The printer may not be ready to print. It may be turned off or set off-line, or the paper or ribbon may be exhausted or incorrectly loaded. Find and correct the problem. If the printer does not start and the computer does not unfreeze, reboot and try again.

You may have to use PRINTER to assign the LST device to the port that is connected to the printer. Consult your computer's user's manual for information about your computer's ports, or ask an experienced person for advice.

CP/M displays a message that says something like `Printer error`. *This message may be on the status line if your computer has one.*

Same causes as the preceding problem. This is CCP/M-86's usual response.

The printer prints nonsense.

Your computer and your printer are not configured the same way. Ask an experienced person for assistance.

This problem may also be caused by an incorrectly wired cable. Be sure the cable connecting the computer and printer is intended for use with the kind of computer and printer you have.

After printing a few lines of text, the printer begins skipping characters or groups of characters. It might beep, print text backwards, or halt.

Your computer is sending data to the printer faster than the printer can print it. The printer should inform CP/M when its data buffer is full, so that CP/M will not send data when the printer is unable to receive it. Something is preventing that from happening. This condition is referred to as *buffer overflow* on the printer.

This symptom may be caused by a problem in your printer's or computer's hardware, in the cable connecting the two, or in your computer's version of CP/M. Ask your CP/M dealer or another experienced person for assistance.

When you print a text file with PIP, or with `^P` *and TYPE, the print-out contains nonsense as well as text.*

You are trying to print a text file that was created with a word processing program, and that program stores information about such text features like margin settings and paragraph ends in the file. CP/M is misinterpreting that information as text.

Nothing is wrong. When you print this text file with the word processing program you used to create it, the nonsense will not appear.

When you print a text file with PIP or TYPE it is printed correctly, but some of the characters in the file are displayed incorrectly.

Same cause as the previous problem. Nothing is wrong.

CP/M displays the message `Printer busy`.

Another user is using the printer. Wait until the printer is free and try again.

Coming Up...

In future installments we will describe how to set up devices for your system, and how to set up a memory disk. We will also cover filename passwords and attributes.

Next Time:

- ASM Tutorial
- Amateur Programming
- Evaluation of CLIP, high performance CP/M "shell."
- Public Domain File Utilities for CP/M and MS-DOS.
- EUREKA vs. CATALOG: Two disk cataloguing programs.
- Application: Network of Bowling Centers (Condor and OSM Zeus 4 System).
- MS-DOS Part 3: Commands

DEPARTMENTS

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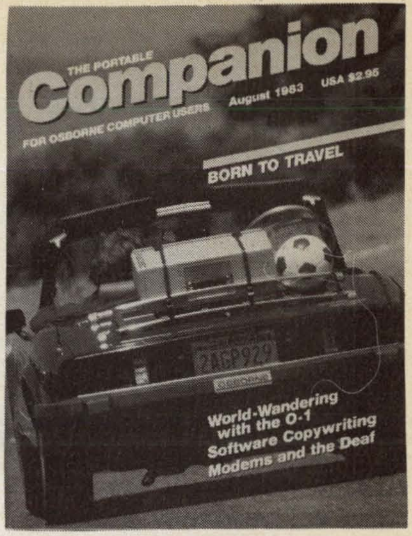
CALCAIDS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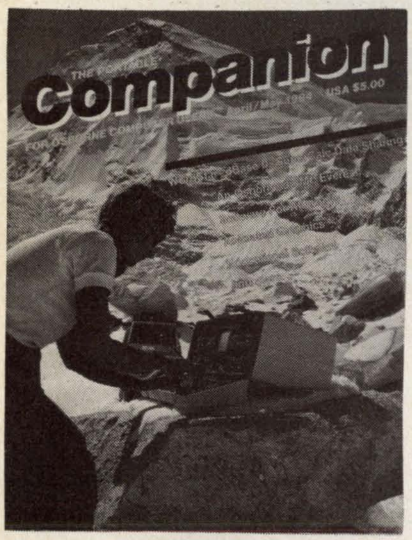
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Watch Your Language

by Steve Rosenthal

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Typesetting Conventions

Throughout this article we use *THIS typeface* to show exactly what you should type at your keyboard, with the special symbols ↑ for the Control key (CTRL, CNTL or ALT on some keyboards), and ↵ for the Return key (RET, CR or Carriage Return on some keyboards). We also use This Typeface to show messages displayed by the system or by programs.

For this article we also use THIS typeface for marking symbols and words or phrases to be corrected, and *THIS typeface* for the suggested corrections.

If you aren't too proud to accept help with your writing, you may find Punctuation & Style a useful addition to your software tool kit. This set of two programs does some of the work of a proofreader or copy editor, but faster and more patiently. The package points out possible errors in the use of punctuation marks, looks for certain typographical errors, and checks your text against various lists of erroneous or inappropriate phrases.

In general, I liked working with the programs. They're relatively easy to use, informative, and make a visible effort not to be dogmatic. Both programs include provisions for bypassing the flagging of any type of errors, which is especially nice when you don't agree with the program's view of grammar.

You can use the Punctuation and Style programs with any straight text file, plus there are easy setups for Wordstar, Magic Wand (also Peachtext) and Perfect Writer. With a little more effort, the programs can be configured for most other popular word processors. Depending on what you request, the programs will either run interactively, asking you to ratify the marking of each suspected error, or in batch mode with output to a file.

The documentation explicitly points out that these programs are no substitute for good writing or editing — they won't help with organization, pace, tone, verb agreement, content or the finer points of style. If you're looking for the artificial intelligence text processor that changes rough drafts to immortal prose, you'll have to wait a little longer.

Cleanup

The first of the two programs in the package, CLEANUP, is the proofreader part. It checks for misuse of punctuation marks, doubled words (for example this one one), unusual capitalization, proper number format and pairing of quotes, brackets and other specified symbols. You'd normally use it in addition to a spelling checker.

CLEANUP does an excellent job of finding certain types of punctuation errors, especially ones that are likely the result of a typographical errors. It will catch missing periods at the end of sentences, extra punctuation marks, com-

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mas and periods in the wrong position in relation to quote marks, and too much or too little space preceding or following commas, periods, exclamation points, question marks and dashes.

For numbers, CLEANUP checks that any embedded commas mark off groups of three digits, any decimal point is preceded by at least one digit, and no commas are included to the right of the decimal. I suppose there would have to be separate European and South American versions, since rules for numbers there are different, even in English-speaking countries.

CLEANUP also checks to see if your capitalization seems to meet what it expects. It will flag any sentence beginning with a lower case letter, and certain mixed case words. It accepts words with a single leading capital (as in Heather), capitalized words with trailing lower case possessives (BASIC's), and capitalized words with trailing lower case plurals (ICBMs). Any other combination of more than one capital plus lower case letters is flagged.

Another important function of the program is to check for mismatched paired symbols. In the standard configuration, it checks for unpaired parentheses, square brackets, braces, and quote marks. You can easily add other items to the list — for example, for use with WordStar, you probably would want to check for a mismatch between commands to turn on underlining and commands to turn it back off again.

As implemented in CLEANUP, pairs have to be balanced within each paragraph, So if you have a long quote or an underline that continues for quite a while, the program will flag this as a probable error. But you can choose to ignore the error in the interactive mode, or edit out that marker from a file produced by batch mode.

The program does recognize the right parenthesis as a special case. Because it is commonly used for marking numbered lists (e.g. "2)"), CLEANUP will allow you to have an excess number of right parentheses without objecting.

CLEANUP will not find errors that depend on the meaning of the sentence. For example, it would not notice if the comma were missing in this sentence after "For example." It uses a word list to distinguish between abbreviations and improper use of periods. Similarly, it relies on another list for exceptions to the rules of capitalization.

Running CLEANUP

If you want the standard run-through, using CLEANUP couldn't be simpler — you simply type:

```
A>CLEANUP B:YOURFILE.TXT↵
```

The file YOURFILE.TXT can be any standard ASCII file or a formatted file created by several popular word processors. CLEANUP reads in your file and checks it against the rules built into the program. When it finds an apparent violation, it displays the suspect text with an error message, and waits for you to say whether you want the problem ignored or marked (you can also quit).

If you choose to have the error marked, CLEANUP adds a marker character where it detected the error, plus a longer explanation of what seems to be the problem at the end of the paragraph. You can change the marker character in the configuration file or with a parameter when you invoke the program — as delivered, the default is the @ symbol.

Unless you specify otherwise, CLEANUP creates a new version of your file containing the original text with numbered markers at each error and correspondingly numbered explanations after each paragraph. You can dispense with the explanations, or skip the text file output if you only want to see the errors on the screen. If you don't want to sit there and reply to each suspected error, you can specify batch correction, and CLEANUP will act as if you had confirmed every indicated problem.

If you do have a text file made, your original file is renamed with a ".BAK" extension, and the new file takes the original name. You then take your word processor and edit this new file, search for the marker character to find where you need to rework your text.

Customizing CLEANUP

Customizing CLEANUP for your word processor and your own personal preferences is a quick and relatively easy job. There is no install procedure, but the manual gives a clear description of how to create the needed 12-line file called CLEANUP.OPT.

Using a word processor (even ED on CP/M or EDLIN on MS-DOS), you create a file with one type of instruction on each line. The first line is the default starting instructions, usually a command to write an output file. The second gives the character that marks the start of any lines to be ignored (the "." for dot commands in WordStar, the "X" in Magic Wand). The next is the soft hyphen character, which you use to indicate possible word breaks to your word processor.

You put the characters that should be in pairs on the next two lines (usually one character turns on a feature or marks the start of a region and a mating characters turns the feature off or marks the end). This is where you normally put parentheses, brackets, and the like, as well as commands to switch to red ribbon and to black.

On the next line, you put any toggle characters, where the same character is used in turn to turn a feature both on and off. For example, you would put *cS* here for WordStar, indicating that Control-S (used to mark underlines) should be turned off each time it is turned on.

If you want to use certain characters to mark regions in your text that CLEANUP should skip entirely, you can enter them on the next line. You use this feature when you have charts, poems, or other non-textual regions in your documents.

The eighth line is where you tell CLEANUP what characters to use to start the lines it adds as explanations for marked errors. For example, in WordStar you can use .., and Wordstar will treat these added lines as non-printing dot command comment lines. Line nine holds the characters used to end the added line, usually a Return (carriage return-line feed pair).

Line 10 is one reason I can use these programs without getting upset — you enter here the number of any class of errors that you do not want marked. I also put at least number 24, the code for the program's view that a dash is never preceded by a white space — on the contrary, even when I used to set type I believed that for good typography there should be extra space before a dash, and on typewritten material it is essential.

The last two lines are for marking any sequences your word processor uses for formatting commands, so they won't be proofread as text. For example, on Perfect Writer, you enter the @ and the corresponding *)* symbols, so CLEANUP will ignore parts like: @ STYLE(INDENT 5 CHARS).

You can run CLEANUP without any customization file at all, and it will work fairly well with text that doesn't contain formatting instructions. You can also make different CLEANUP.OPT files for different types of documents, or for use with different word processors.

Turning a Phrase

The second program in the Punctuation and Style package is more like a copy editor than a proofreader. The PHRASE program checks your text against a selection of several hundred phrases that the program author feels you should avoid. If you don't agree with the selection, clear instructions are given on how to make your own phrase lists.

Again, the program only matches your text against a list of possible errors rather than actually reading and comprehending it. A word or phrase included in the list because it is inappropriate in one context may the right thing to say in another. You definitely need to consider whether you agree with each point marked by the program, either interactively or by editing a file marked in batch mode.

You're also reminded in the introduction to PHRASE that the program is only pointing out potential problems, not finding definite errors. As the introduction says, "Don't take PHRASE's advice too literally. It serves only to advise..."

Using PHRASE

To use PHRASE, simply type:

```
A)PHRASE B:YOURFILE.TXT↵
```

The file YOURFILE.TXT contains the text to edit. For PHRASE to run, the file PATTERNS.TXT (containing the list of suspect phrases) must also be on the default disk.

You can choose up to four additional parameters when you invoke the program. The *$P* parameter will put the suggestions for correction at the end of each paragraph, while the *$S* parameter puts the suggestions after each problem sentence. The *$Q* parameter tells the program to assume that you want all problems marked, allowing PHRASE to run in batch mode. And if you want to use other than the standard phrase list, you can add the name of another phrase file, Directions for how to do so are included in the manual (although in the middle of the text and not in an appendix where they really ought to go).

As PHRASE works through your file, it shows you each problem area with the suspect word or phrase marked with square brackets. You then have the choice of marking the phrase, ignoring it, printing the sentence with the problem on your printer, or adding this sentence to a list of ones that you consider acceptable even if the program doesn't. If you choose the last option, PHRASE creates another file listing codes for each sentence that should be exempted from further criticism. These sentences will be ignored, even if they change position in your text.

The Offending Phrases

As presented in the manual, phrases that the program marks are comprised of eight classes. You are given an explanation of what the class includes, why it should be avoided, and an illustrative section of text with the problem areas shown in doublestrike. Then, you are shown the same text with the problem areas corrected.

The first class consists of phrases that the program labels awkward. Most of the items are two to five word phrases that the program suggests you replace with a single word — such as replacing as a consequence of with *because*, or leaving out of consideration with *disregarding*.

PHRASE's cliche class includes as per, at hand, and literally, all of which it says you should avoid altogether. It suggest you substitute *separately* for under separate cover and *for* in place of in the amount of.

The next category consists of phrases that the program marks simply as "erroneous." Some examples are orientated (use *oriented*), alright (use *all right*) and zonality (use *zone*).

While maintaining the validity of dialect and regional speech patterns in their place, PHRASE normally flags locutions that are less acceptable in formal, written English. If you use sort of, all the farther, has got to or several dozen others in this class, PHRASE will let you know about it.

PHASE objects to another class of word groups because they are normally used to keep a discussion "muddy." For fullest possible extent, PHRASE says use *fully*; for there is reason to believe, substitute *I think*.

Pompousness is often a matter of opinion. PHRASE objects to a preference for (but likes *prefer*); at present (*now*), in light of (*because*) and utilize (*use*).

The program also marks what it considers redundancies. These include collaborate together (use *collaborate*), final outcome (*outcome*), very safe (*safe*) and very unique (*unique*).

The last of the eight categories is "word phrases." The program says instead of a lot of use *many*; for call your attention to use *tell you*; for first of all use *first*; and for with the exception of use *except.*

Staying Active

You can also have PHRASE attempt to mark passive sentences in your text. These are sentences where the grammatical subject of the sentence does not perform the action — the example used in the manual is The ball was kicked by John.

This part of the program does not work as well as the others, although it still may be helpful. Theoretically, it looks for sentences fitting a pattern of a verb "to be" plus the past participle of the main verb (e.g. "was written"). Most of these sentences also contain prepositional phrases that present the information that an active sentence would include in the subject.

Finding the past participle of all verbs in the English language is obviously beyond a program like this, so the actual search pattern used is to look for any sentence containing a form of the verb "to be" and one or more prepositions. Thus, the program objects to I was there too, by the way, while passing Passiveness should be avoided.

Installing PHRASE

As with CLEANUP, you can customize PHRASE by creating a short file with a text editor. There are only nine lines to the PHRASE.OPT file.

Line 1 again gives any default command line. The next line contains any non-alphanumeric characters you want accepted in words — the usual entry is the apostrophe. Line 3 defines any soft-hyphens. Line 4 and 5 are the characters to use to mark problem phrases, normally [and].

Line 6 tells PHRASE how you want comment lines started (.. for Wordstar dot command comments), line 7 how to end them (normally carriage return-line feed). On the next line, you specify what character marks any lines in your text file to be ignored (a "." for Wordstar), and the last line is how wide your screen is (so the program knows where to wrap comments).

If you want to create alternative phrase lists, you might take a cue from a similar program called Grammatik. That product has a list of gender specific terms — just what you need for editing implicit sexism out from your writing.

Documentation

The manual for the programs is generally well written, but still is lacking in several respects. Its greatest limitation is the reliance on text alone to get its message across — you won't find a single diagram or other visual aid in the entire 90 pages.

It also suffers from an obvious case of the word-processor worldview — aside from titles on the cover, the entire text is reproduced from the output of a daisy-wheel printer. This leaves only one size and two weights of lettering to work with, similar to attempting to write evocative descriptions using minimal business English.

On the plus side, you will find a table of contents, and for each program an introduction, installation instructions, a worked out example and a clear presentation of the operation and parameters. The examples use interesting text, avoiding those awful sales pitches that some other manuals try to get you to read through. The manual also explains clearly the points of grammar the program checks for, the rationale for doing so, and how it presents what it finds. There are appendices for customizing the programs, building new phrase files, the exact rules of punctuation used, and a listing of all the error messages.

Should You Buy It?

If your self-respect, livelihood, career advancement or social success depends to any significant degree on the degree of perfection of your text output, you ought to invest in a program like this. Just as most people who write regularly with their computers find a spelling checker program worthwhile, you'll probably find investing in this writing aid worth the cost because it helps prevent careless mistakes from diverting attention from what you have to say.

The proofreading part will save all but the most eagle-eyed a continual assortment of small typographic mistakes and perhaps an occassional large one. The general phrase checking may or may not be useful to you, depending on how much you can come up with a phrase list you can find consistently useful. If you write at different levels, you might find it worthwhile to develop several different lists, one for each audience.

If you don't have an ear for the difference between passive and active sentences but do agree that passive ones should be avoided, this program will help you spot them. You may find that its rules in this area a bit rigid, but if you have the time to review each objection it may be worthwhile.

One big advantage of these programs is that they are completely impersonal — you can show as many drafts with any number of errors to CLEANUP and PHRASES, and you won't ever endanger your social position. This is especially important if you are hesitant to show your drafts to other people, yet need to produce an acceptable final product.

You should not, by any means, consider these programs as a substitute for having a person read your drafts. These programs will find many of those small, annoying typographical errors that a person might miss, but they'll completely ignore it if you misuse a word, forget to complete a phrase, explain a topic poorly or adopt the wrong attitude towards the reader. As always, the final result is up to you.

Punctuation & Style
The Word Plus
Oasis Systems
2765 Reynard Way
San Diego, CA 92103

Ed. note: We use Punctuation & Style to help prepare articles for publication, along with the excellent spelling proofreader and correcting program, The Word Plus, from the same software company, Oasis Systems.

The Ampro Bookshelf Computer

The Ampro Series 100 packs big performance in a small size.

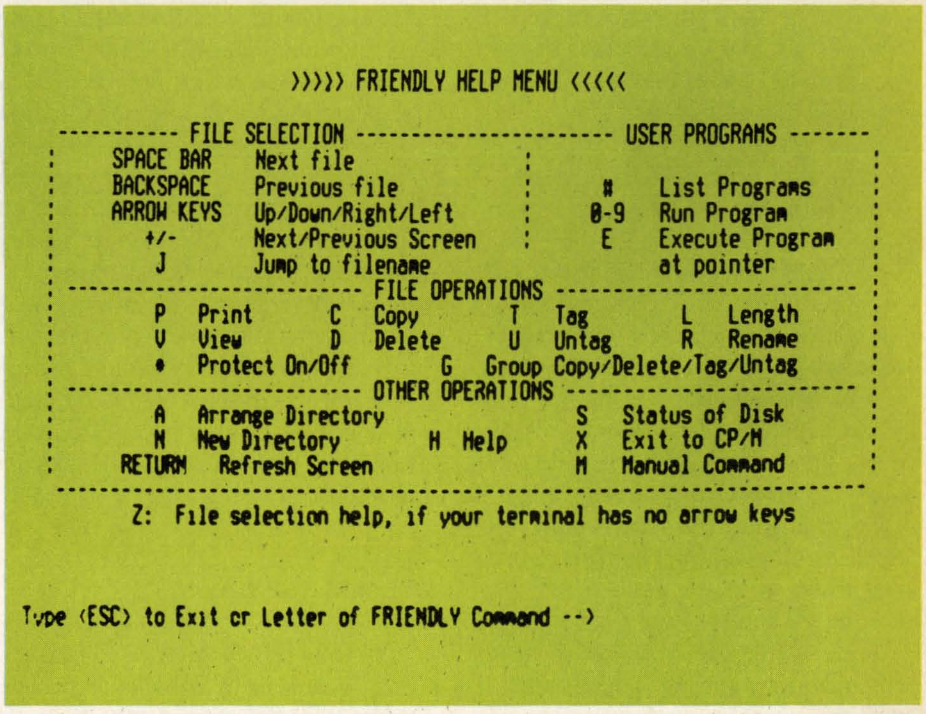
It purrs quietly on my bookshelf, occupying less than 1/3 of a cubic foot of space. It is probably the smallest and simplest CP/M computer available at this time.

The Ampro Series 100 computer consists of a 4 Mhz Z80 powered single board computer with two programmable RS-232 serial ports, 64K of dynamic RAM, a centronics compatible printer port, dual disk drives and a switch mode power supply.

The heart of the Bookshelf Series 100 is the single board computer called the "Little Board." This component measures 5.75 X 7.75 inches and is intended to be mounted on the bottom of a standard 5 1/4 inch disk drive. This Z80 based board consists of 64K of RAM operating at full speed (no wait states), a 4K boot ROM, a single chip mini-floppy disk controller, dual RS-232 serial ports with programmable baud rate generator and the centronics parallel port.

With all these parts on a small board one would expect the layout to be compact. Not true, the board has a open layout and should be quite easy to maintain. As an engineer, I can appreciate the work involved to make the single board computer compact yet serviceable. The Little Board is available separately, and can be built into a complete computer by system engineers and advanced hobbyists.

by Jerry Haigwood



```
                    >>>>> FRIENDLY HELP MENU <<<<<

 ---------- FILE SELECTION ---------------------- USER PROGRAMS -------
 :    SPACE BAR   Next file                  :                          :
 :    BACKSPACE   Previous file              :      #    List Programs  :
 :    ARROW KEYS  Up/Down/Right/Left         :     0-9   Run Program    :
 :       +/-      Next/Previous Screen       :      E    Execute Program:
 :        J       Jump to filename                       at pointer     :
 : ------------------------- FILE OPERATIONS -------------------------- :
 :        P   Print        C  Copy        T   Tag         L   Length    :
 :        V   View         D  Delete      U   Untag       R   Rename    :
 :        *   Protect On/Off         G  Group Copy/Delete/Tag/Untag     :
 : ------------------------- OTHER OPERATIONS ------------------------- :
 :        A   Arrange Directory                  S  Status of Disk      :
 :        N   New Directory        H  Help       X  Exit to CP/M        :
 :     RETURN  Refresh Screen                    M  Manual Command      :
 -----------------------------------------------------------------------
       Z:  File selection help, if your terminal has no arrow keys


Type <ESC> to Exit or Letter of FRIENDLY Command -->
```

Figure 1.

Ampro chose high-density 5.25-inch disk drives as their mass storage devices. Two models of the Bookshelf computer are available with either two 400K Byte drives or 800K byte drives. These high-density drives make the Bookshelf computer an ideal candidate for use in data base management environments.

To complete the system, Ampro selected a compact switch mode power supply emitting +5, +12 and -12 volts required by the computer board and disk drives. The hardware is packaged in an attractive heavy gauge steel and aluminum cabinet. No corners were cut here! The front of the box is heavy gauge aluminum with vertical cut outs for the dual disk drives, a power switch, and a reset switch. The rear of the box has two DB25S (RS-232) connectors, a dual row header style connector for the centronics printer port, and a 34 pin header connector for disk drive expansion.

The Ampro BIOS (basic input output system) allows almost any 5 1/4 inch disk drive to be plugged into the drive expansion port. Drives can "mixed" and "matched" and the operating system automatically determines the type of drive connected. This enhancement allows the owner to choose drives of his/her liking for expansion.

Ampro Bookshelf Computer

The Ampro Series 100 Bookshelf Computer is available from Ampro Computers, 67 E. Evelyn Ave., PO Box 390427, Mountain View, CA 94039. Phone: (415) 962-0230.

Hardware: 4 Mhz Z80 with 64K RAM, 2 programmable serial ports, centronics printer port, dual 5 1/4 inch disk drives.

Software: CP/M 2.2 with ZCPR3, FRIENDLY user shell, T/MAKER III integrated applications, MULTIDSK disk translation, MULTIFMT foreign disk formatter and System utilities.

Price: $1295.00 for model 122 (two DSDD 48 tpi drives), $1495.00 for model 142 (two DSDD 96 tpi drives)

Options: Technical Support Package includes the source code for the enhanced BIOS and all System utilities. Price is $49.00.

Software

The system is supplied with CP/M 2.2, ZCPR3, T/Maker III and various system utilities.

ZCPR3 and FRIENDLY

Rather than supply the Bookshelf computer with plain vanilla CP/M 2.2, Ampro chose to distribute CP/M 2.2 with ZCPR3, a much improved version of CP/M's command language interpreter, with much improved commands to use. The part of CP/M called the Console Command Processor (CCP), which is the part that responds when you type a command, is replaced by ZCPR3. ZCPR3 has all of the familiar CCP commands plus a number of significant improvements:

- Multiple commands on one line (multiple command processing).
- Automatic searching along a designated "path" of disk drives for a program name you type as a command (no need to put drive prefixes on the names of programs to execute them from other drives).
- The ability to move and copy freely between user areas.
- Improved error "trapping" and response.

(ZCPR3 deserves its own article, which we intend to publish in a future issue — eds.)

CP/M usually displays a command line that gives no help whatsoever to a beginner, no clues as to what commands to type. Computer manufacturers pride themselves on their "menu" programs that come between you and this ambiguous command line. A "menu program" usually provides all of the operating system commands in a menu from which you select them with a single keystroke.

Ampro provides an excellent one called FRIENDLY, which automatically starts up when you start the system or press your reset button. FRIENDLY lets you do file handling and program access by moving an arrow to a menu entry on the screen.

FRIENDLY's install program is also menu driven and allows you to customize FRIENDLY for your terminal. FRIENDLY takes advantage of the fancy features of your terminal, such as the arrow keys and reverse or highlighted video.

FRIENDLY displays a horizontally-alphabetical disk directory with an arrow pointing to the first file (figure 1). You can move this arrow using your cursor control keys, or you can use the popular WordStar control keys (`^D`, `^E`, `^S` and `^X`) to move the arrow.

With the arrow pointing to the file of your choice, a simple one key entry lets you do almost anything to a file. If the file is a program, you can run it. If the file is an ASCII text file, you can display it. You can rename it, copy it, delete it, print it, or tag it for processing (copying, deleting, printing, etc.).

At the completion of any operation including the execution of a program, you return to the FRIENDLY menu. It is possible to have a new computer user become productive with the computer and never see CP/M's old familiar `A>` command line.

If you need them, "help" messages are displayed by typing `H`. You can display a screen of commands by pressing the `?` or `/` key.

FRIENDLY also has a powerful "macro command" mode. You create up to ten sets of commands called "macros" and execute any macro by typing a single digit (0-9). To create macros, you can edit ones already set up for you in a file called FRIENDLY.OVL using any word processing or text editing program.

You can use multiple ZCPR3 commands in macros, which can make them very powerful. You could set up an application program to run its own command file automatically, and move right to a data entry screen with the touch of one key. This macro facility lets you use your number keys as function keys.

FRIENDLY is surprisingly fast compared to other menu programs. It provides instant access to the regular command line and a host of operations that can be performed quickly. It helps beginners use the computer without getting in the way of experienced users.

T/Maker III and Utilities

The Bookshelf Series 100 computer is also supplied with T/MAKER III, an integrated package that performs the most widely used computer functions: word processing, list processing, list and report merging, data base access, computing in spreadsheets and producing bar charts. This excellent package is all that most users will ever need. T/MAKER III received an excellent review in a previous issue of *User's Guide* (issue #7).

Ampro's utility programs are some of the best I have seen for a small computer system. In addition to the normal format, copy, and sysgen programs, Ampro supplies MULTIDSK and MULTIFMT. MULTIDSK allows reading and writing to and from more than 30 different 5.25-inch disk formats.

Included are Kaypro II and 4/10, Osborne I and II, Morrow MD2 and MD3, Zenith 89 and 100, DEC Rainbow, Sanyo, Xerox I and II, and IBM PC formats. You can freely exchange data files between these various computers and the Bookshelf Series 100. MULTIFMT lets you format (create) disks using many of these disk formats. Software vendors will appreciate this feature.

(Ed. note: We appreciated the disk reading utility, as well as ZCPR3, FRIENDLY, the compact size of the unit and its price, and cited all as reasons for buying one, which we did. We use it to read many different disks and perform the final step of article preparation for typesetting.)

Also included is an excellent configure utility. CONFIG lets you change several important parts of the operating system to match the accessories available.

For example, if you have a printer with a serial interface set up to run at 1200 baud, it is a simple process to use the CONFIG program and select the proper choices from the menu for the printer port (port "B") to use a rate of 1200 baud.

Besides baud rate, you can change the word length, the type of parity and the number of "stop bits" used in the communication protocol.

CONFIG also lets you to set the number of drives you have and the stepping rate for each drive. You can add the hardware, and then run CONFIG to change the software. This feature alone is worth a considerable amount of money. I have dealt with other companies who charge up to $150 to install a new BIOS which allows additional drives.

Ampro sells the source code to these programs as part of their Technical Support Package. Price is $49 and also includes the source code for their enhanced BIOS and system utilities.

Getting Up and Running

You only need to take a few minutes to assemble the system. Assembly consists of connecting a RS-232 cable between the Bookshelf computer and any ASCII terminal. Almost any terminal will work if it is capable of running at a 9600 or 19,200 baud rate.

You insert the system disk into a well marked drive "A" and turn on the power. The Bookshelf computer starts CP/M and ZCPR3 automatically.

Ampro supplies two manuals with the Bookshelf computer. One deals with the hardware and is intended for a technician, programmer or advanced hobbyist. The other manual is a "user's guide" in the usual style that first explains how to perform a backup and get started, and then provides a reference to the commands. Included with the "users guide" is a complete explanation of FRIENDLY. These manuals are written in an easy to read style and should be understandable even by the first time computer user.

If you have any questions not covered by the manual, Ampro offers customer support by phone or mail. Nothing irks me more than to call a computer company with a problem and have the person on the other end tell me to read my manual. If I could have found the answer in the manual why would I waste my money or time calling the factory? You won't find Ampro telling you to read your manual.

Conclusion

After having used this computer for 5 months, I can say that the Bookshelf Series 100 computer is everything it is claimed to be. It's really nice to find a product that does exactly what the manufacturer said it would do. I own other computers, but I have used mostly the Ampro since receiving it.

I was very impressed with the speed of the disk access. Ampro spent a considerable amount of time optimizing the BIOS for the fastest disk read/write I have seen in a 5.25-inch drive system.

I own another popular CP/M system with 5.25-inch drives and benchmarks have shown that the Ampro writes 50 percent faster and reads 20 percent faster than this system. Both systems use identical drives (stepping rates are the same) and both have 4 Mhz Z80 processors.

Is there anything I don't like? Well personally I would liked to have seen a SASI (Shugart Associates Systems Interface) included in the design for easier adaptation of a hard disk. However, after looking at the board size I can understand why it was not included. Several distributors have taken care of this problem by offering a plug in adapter board for use with their hard disks.

Two models of the Bookshelf Series 100 computer are available depending on the the amount of disk storage you need. The model 122 has two half-height double-sided 48 tpi drives for a total system storage of 800K bytes and retails for $1295.00. The model 142 has two half-height double-sided 96 tpi drives for a total storage of 1.6 megabytes and retails for $1495.00. Both systems are delivered with identical software packages.

When you add up the size, performance and Ampro's commitment to customer support, the Bookshelf Series 100 computer comes out a winner.

For Starters

continued from page 5.

your corporate computer must be set up to receive the data.

Sharing data over communications lines with any type of computer, be it a corporate minicomputer or another personal computer in the office, is fraught with the problems associated with incompatible equipment. It may sound simple in the advertisements, but you cannot simply connect computers over phone lines and share data. You have to make sure that (1) the two computers (hardware and cable ports) are compatible enough to communicate at all, (2) the communications software at both ends is capable of high-speed transmission and reception without errors, and (3) the data files themselves are compatible between the computers.

The easiest way to share data between two personal computers is to share disks, if they are compatible, and to use the same application software in both computers (the same spreadsheet program, the same word processing program, etc.).

You can also send and receive data between two personal computers using modems and phone lines. This is the easiest form of data communications, but not necessarily the quickest form of data sharing. It may take only seconds to transmit a spreadsheet, but it may take over an hour to transmit a data base, depending on the transmission speed you use.

With a personal computer at the office (or anywhere) left on and running and attached to the telephone with a modem and the appropriate communications software, you can call that computer from your home computer and run programs on the office computer as well as share data. For example, if your office computer has a printer and both printer and computer are on, ready to answer a call, you could phone in some data and start printing it. This is called using your computer as a "remote system."

This technique is complicated enough to warrant our full treatment, so we will be covering the setup of remote systems in a future issue of *User's Guide* (we are setting one up to act as a bulletin board for the magazine).

The remote system may be just what you need to share data from your home computer to your office computer. But what about the other users of your office computer? How do you share data during working hours?

Corporate Data Processing

In most offices the computer is the tool most in demand. A computer bottleneck can slow down productivity or even bring a business to a halt. What is it that everyone needs the most? In most cases, the office workers need access to inventory and accounting data of some sort, and they need the ability to print that data on various forms.

In the past, the initial choice for businesses starting to computerize was a minicomputer system that offered terminals to accommodate many people, and one or more large-capacity hard disks to accommodate the data, plus one or more printers to print invoices, receipts, statements, etc. Everything was controlled by one computer; if that computer became temporarily "hung up" on something, the other users experienced what became known as a "system crash."

To avoid a complete business shutdown when a system crashed, corporate data processing departments tried to distribute their computer activities over several computers, and if one crashed, the others could continue and perhaps take over the duties of the one that crashed.

With the advances made in silicon technology, the minicomputer manufacturers were able to offer what they called "distributed processing," which was essentially smaller minicomputers in separate locations performing tasks with *copies* of the data. The data was updated from a central computer on a regular basis, perhaps as quickly as every second or as slowly as every day.

For example, a branch of a large bank would have its own minicomputer to process transactions at that branch. However, if you are a customer from another branch and you want to withdraw money, the branch might want to confirm the account balance by check-

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ing in with the other branch computer or with the main office computer. This may take only seconds; however, if your spouse was also withdrawing money from the same account at the same time from another branch, you would think it possible for that other branch computer to not know the real balance of your account.

What actually happens is that when the first branch checks your account record, it *locks it* temporarily. The other branch computer waits until *your account record is unlocked* before it checks your balance.

These were the first "real-time multi-user" systems. They were the first to have this *file and record locking*, which helped avoid the problems that occur when multiple users try to access the same data. If, for example, you tried to place an order at the same time another worker placed an order, the system would be sophisticated enough to make you wait a moment until the other order was placed, so that inventory and accounting data would be updated correctly.

Not too many small businesses could afford a minicomputer for "real-time" applications. These businesses used "computer services" for accounting, payroll and other applications. A computer service could afford a minicomputer because it could handle more than one client. However, the "service" from these services was more often criticized than praised, due to the fact that the most current data was not available where the business needed it most: in the office.

A market soon developed to sell computers to small businesses. The "low-end" $50,000 minicomputer was designed to help small businesses computerize "inexpensively." Of course, the $5000 personal computers have now moved in to replace the "inexpensive" minicomputer.

Personal Computers Invade the Office

As corporate DP manager you watch in amusement as line managers and executives bring personal computers to the office to help them plan budgets, forecast sales, connect up with stock market services, and do their own word processing and graphic presentations. The problems occur when these personal computerists try to share data with the larger, established minicomputer systems.

For one thing, the software is not the same from one type of computer to another. This makes it hard to share data among incompatible computers (like the IBM PC and the Apple //e, both very popular in offices). You have to convert the data to a text file format, transfer it via cable, disk or modem to the other computer (in many cases the disks are not compatible), then "read" the text file into your application program's format.

This is the most-often-used method for sharing personal computer data with a minicomputer system, or sharing minicomputer data with your personal computer. This is the usual method of sharing data among personal computers that are not the same brand or are not compatible.

CP/M and MS-DOS computers are the exception here, because they can run the same software, and data can be kept in its original format during CP/M-to-CP/M or MS-DOS-to-MS-DOS computer transfers. Note, however, that CP/M-to-MS-DOS and MS-DOS-to-CP/M transfers sometimes require that you convert the data to a text file format during transfer.

Local Area Networks

As personal computers from different manufacturers appeared in offices and attempts were made to tie them together, some hard disk manufacturers brought out interesting solutions that were eventually called *local area networks*.

A local area network is loosely defined as a set of computers communicating with each other over a short distance — usually within an office or a building. Your personal computer, when connected to the network, still works as if it were by itself, without help or interference from the other personal computers on the network, and without a loss in system performance. But when you want access to data stored on the shared hard disk, your computer sends the request to the hard disk "file server" computer and thereby gains access to the shared data base.

Typically a local area network has one *file server*, which is a computer dedicated to controlling access to a shared hard disk, shared printers and any other devices. In addition, the network must have some type of cable (such as a modem, a parallel or RS-422 cable, or a physical Ethernet system).

This technology was relatively new and therefore expensive on a per user basis. Many offices decided instead to use one super personal computer (microcomputer) with a hard disk act as "home base," and use other personal computers of the same brand in order to swap disks.

Hard Disks

The advantage of having a *hard disk* with your personal computer was obvious almost from the start, but the hard disk units had to come down in price and go up in reliability.

Today's hard disks can make almost any computer activity more productive and less time consuming. A hard disk is essential for using a computer to manage a business or profession. Also essential is some appropriate method or special device for "backing up" the data on the hard disk.

Most personal computers with hard disks rely on the use of high-density 5.25-inch "floppy disks" for backing up the hard disk. The floppies don't perform the work of the hard disk, but they can restore your data to a new hard disk if your first hard disk fails.

Other quicker methods of hard disk backup are devices like the removable cartridge tape and the removable hard disk cartridge. Both are new technologies designed for today's personal computers.

Multi-user Micro Systems

As eight-bit computers expanded to include hard disks, manufacturers developed multiple-user systems like

Digital Research's MP/M and MP/M-II, TurboDOS (from MuSYS), and others.

Multi-user systems were designed to fill a specific need for one computer to handle the computing needs of two to six people. The hard disk provided the capacity to handle large amounts of data, but the operating systems in most personal computers would allow only one user at a time to use the computer. The multi-user system could operate several terminals and slice the computer's time into as many sections as needed for the multiple users.

The first multi-user micro systems operated more slowly as you added more users (just as with minicomputer systems), and they did not offer file and record locking.

Today we have MP/M II (Digital Research), MMMOST (TeleVideo), TurboDOS (MuSYS) and Oasis (Phase One) for eight bit computers, and MP/M-86, Concurrent DOS (Concurrent CP/M-86), and TurboDOS for sixteen-bit computers, all offering multi-user capability and CP/M compatibility. UNIX (Bell Labs), PC-IX (IBM), XENIX (Microsoft) and others are also available for sixteen-bit computers.

Today's multi-user microcomputers are based on the design of real-time minicomputer systems. For example, the CompuPro 8:16 System C configuration offered in 1983 as much processing power and functionality, and at one-third the price, as the "low-end" minicomputer systems offered in 1978.

The Future: Concurrency

The computer's processor can perform only one task at a time; however, the time it takes to perform a task is an order of magnitude faster than the time it takes you to type at the keyboard or react to data on the screen. For that reason it is possible to divide the processor's time among several tasks to make it appear that the tasks are occurring simultaneously.

Digital Research introduced a "multi-tasking" operating system for personal computers called Concurrent CP/M-86, which can run more than one CP/M-86 program at a time. The latest version of the system, now called Concurrent DOS, can also run PC-DOS (MS-DOS) programs at the same time and make it easy to share data between the CP/M-86 and MS-DOS environments.

The future promises more compatibility between computers because networks and concurrent operating

Continued on page 76.

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CONGRATULATIONS!!

We admire your talents. After all, few people can remember where to find that six month old letter to Wonder Waffle Works, or which of the twenty versions of IMPORTNT.BAS is the one you need yesterday.

Or maybe we should envy your spare time. Ah, to be able to haul out a stack of disks, slip each one into a drive, browse through the directory, and TYPE the various prospects to find that one file or program.

Or perhaps you're the adventurous type who thrills to the challenge of groping through scantily labeled disks, cheering that magical moment when hidden treasures are uncovered.

On the other hand, it occurs to us that you just may not know the advantages of **EUREKA!**, the fast, menu driven disk cataloger for CP/M. **EUREKA!** puts your entire disk library at your fingertips. Files may be found quickly and easily - by name or by comments you can put in the file itself. Of course the manual includes a tutorial to help you get started.

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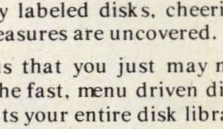

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New Products

CP/M and MS-DOS computers, software, communication products, networks and accessories.

Free information is available on the products described here. We provide a *reader service card* in this issue with numbers corresponding to each product announcement. Simply fill out the reader service card and drop it in the mail (please include your address). We forward your address to the product manufacturer or vendor, who sends you the information.

Thanks for filling out the questionaire on the card. This feedback helps us plot an editorial course, and the answers provide demographic information to media planners. The more responses this magazine can generate, the more it can grow in pages and in product coverage. We appreciate your support.

Computers & Systems

Concurrent PC-DOS

Digital Research announced Concurrent PC-DOS for the IBM PC. The multi-tasking operating system can run up to four PC-DOS or CP/M-86 application programs simultaneously. Concurrent PC-DOS's window capability lets you see the four programs executing on the screen. Windows can be scrolled or sized to display any portion of an application program's display.

Several utilities are provided with the system: a print spooler to queue printer tasks and go on computing, or to run two printers simultaneously; a rolodex program for handling names and addresses; and a remote dial-up link so that two people can use the system at the same time (one could be picking up or leaving messages while the other works without being disturbed).

The system will be available in the third quarter of 1984 for IBM PC systems and for other computers. Digital Research, 160 Central Ave., Pacific Grove, CA 93950 (408) 649-3896.

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Software

Look — No Instructions

The FRIENDLY Home Computer (CP/M and MS-DOS, 64K) is a home management program that comes with no instruction booklet (they claim none is needed). It provides a checkbook that sorts the data into an automatic home budget, including possible IRS deductions. The program also has a "Home Organizer" with sample files containing credit card data, insurance data, banking data, restaurants, theatres, and others.

P & B Computer Services, Inc., also offers "free phone advice to anyone with a problem." Price is $79. P & B Computer Services, 13701 N.E. Bell-Red Road, Bellevue, WA 98005 (206) 641-7390. **Circle 52 on your reader service card.**

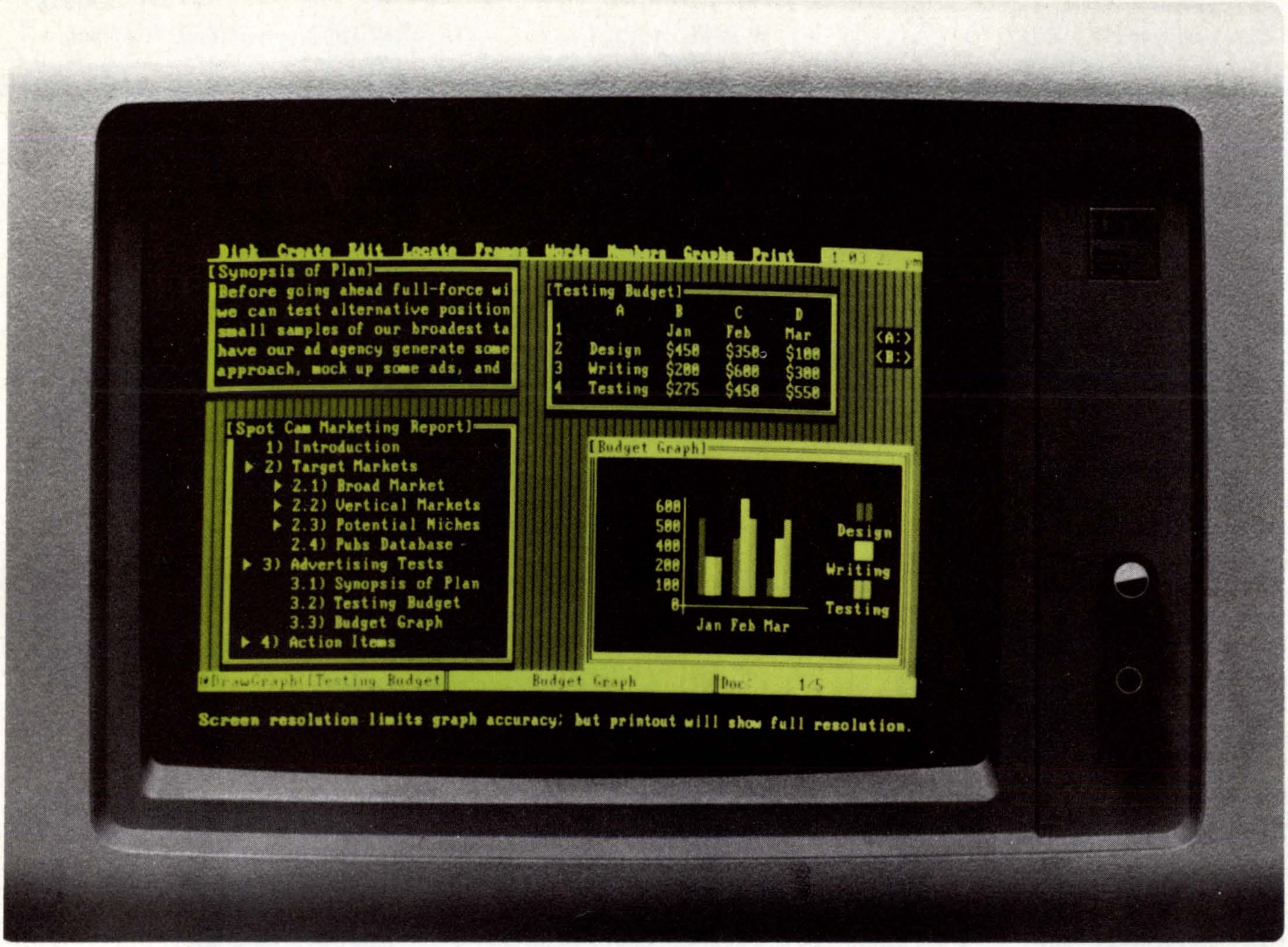
UNIX For CP/M

CLIP® (Artisoft, Inc.) is a program for CP/M-80 systems that provides some of the features of the UNIX operating system (Bell Labs) including output re-direction to files and input re-direction from files, and "pipes" which allow the output from one program to be input to another.

You can also use CLIP to design your own menus and commands for tailoring an application. CLIP has a powerful command language with conditional execution, command tracing, file input and output and string manipulation.

Artisoft, 2450 E. Speedway #4, Tucson AZ 85719 (800)821-6010. **Circle 53 on your reader service card.**

(An evaluation of CLIP will appear in the next issue — eds.)



```
[Synopsis of Plan]
Before going ahead full-force wi
we can test alternative position
small samples of our broadest ta
have our ad agency generate some
approach, mock up some ads, and

[Testing Budget]
        A          B      C      D
1                  Jan    Feb    Mar
2   Design         $450   $350   $100
3   Writing        $200   $600   $300
4   Testing        $275   $450   $550

[Spot Cam Marketing Report]
    1) Introduction
  ▶ 2) Target Markets
     ▶ 2.1) Broad Market
     ▶ 2.2) Vertical Markets
     ▶ 2.3) Potential Niches
       2.4) Pubs Database
  ▶ 3) Advertising Tests
       3.1) Synopsis of Plan
       3.2) Testing Budget
       3.3) Budget Graph
  ▶ 4) Action Items

[Budget Graph]

*DrawGraph([Testing Budget]    Budget Graph    Doc:  1/5
Screen resolution limits graph accuracy; but printout will show full resolution.
```

Framework® from Ashton-Tate lets you display "frames" showing the output of various Framework applications.

Framework

Ashton-Tate announced Framework®, a software package that integrates a full-featured word processor, spreadsheet calculator, business graphics generator, data base manager, forms processor and outline generator. Framework also works with the firm's popular data base management system, dBASE II.

PC-DOS software may be run under Framework, which is available only for the IBM PC at this time and requires 256K. The suggested price is $695.

Ashton-Tate, 10150 West Jefferson Blvd., Culver City, CA 90230 (213) 204-5570. **Circle 54 on your reader service card.**

Financial Decisions

Strategic Software Systems, Inc. announced Bottomline-V, a corporate financial decision system for business planning, raising venture capital, increasing lines of credit, or obtaining an SBA loan.

The system starts with a 12-month detailed budget and cash flow analysis. You input basic data variables and Bottomline-V performs over 9000 calculations to produce five-year pro formas of P&L, Balance Sheet, Changes in Financial Position, and Financial Ratio Analysis.

Bottomline-V runs on most CP/M and MS-DOS computers as well as the Apple. Suggested retail price is $295.

Strategic Software Systems Inc., 1300 Dove Street #200, Newport Beach, CA 92660 (714) 476-2842. **Circle 55 on your reader service card.**

Pertmaster

Westminster Software has released version 4.6 of its critical path management tool for project planners. Pertmaster now lets you customize your system to make use of features like screen colors, use of graphic symbols for the screen and for dot matrix printers, use of function keys and other enhancements.

Pertmaster performs critical path analysis using both activity-on-arrow and precedence networking. Four sizes are available, the smallest of which runs on CP/M-80 systems and analyzes up to 500 activities. Larger versions for the IBM PC let you analyze 1000, 1500 or 2500 activities.

Westminster Software, 660 Hansen Way #2, Palo Alto, CA 94304 (415) 424-8300. **Circle 56 on your reader service card.**

Sales Management

Adler Computer Technology announced CLO$E, a sales and office management program for life and health insurance agencies. Agents can sort client files according to their own parameters to develop lists of potential customers for additional insurance coverage.

CLO$E generates data for personalized form letters that can be produced by WordStar/MailMerge. CLO$E also generates production reports, commission statements, and other reports. There is no upper limit on the number of clients it can handle. CLO$E was designed to work for either a single agent or a multiple-agent office. CLO$E runs on any CP/M-80, CP/M-86 or MS-DOS computer. It can also run under TurboDOS, MMMOST and MP/M. It requires two disk drives (or hard disk) with a minimum storage capacity of 630K.

Adler Computer Technology, 21777 Ventura Blvd. #228, Woodland Hills, CA 91364 (818) 703-0350. **Circle 57 on your reader service card.**

File Transfer/Auto-Dial

The Information People released the InfoShare II software package that can be installed on virtually any CP/M and MS-DOS computer. InfoShare facilitates file transfer between two computers, overcoming the file and disk format incompatibilities between CP/M and MS-DOS (PC-DOS).

InfoShare II can also be directed to drive auto-dial/auto-answer modems and execute predetermined commands or procedures to call and log onto information services, electronic mail networks and host computers.

InfoShare II also emulates many different terminals. InfoShare II can be combined with The Organizer II (also from The Information People) for a menu-driven tailored application.

InfoShare II suggested retail price is $149 for a paired, single-user InfoShare II system; multi-user, network and corporate system licenses are available. The Information People, 443 Hudson Ave., Newark, OH 43055 (614) 349-8644.

Circle 58 on your reader service card.

IBM PC Public Domain

The PC Software Interest Group (PC-SIG) offers a new directory listing hundreds of public domain and user-supported programs available for IBM PC and PC-compatible (MS-DOS) computers. All programs can be freely copied; some "user-supported" programs come with documentation and the authors request a small donation from satisfied users.

The Directory is $4.95 plus $1 postage and handling; a set of ten introductory disks is $59; a complete set of 135 disks is $814. PC-SIG, 1556 Halford Ave. #130S, Santa Clara, CA 95051 (408) 730-9291. **Circle 59 on your reader service card.**

CP/M Public Domain

Elliam Associates offers a catalog of public domain programs for CP/M systems. Included are the SIG/M (Special Interest Group/Micros of the larger Amateur Computer Club of New Jersey), CP/MUG (Lifeboat Associates, NY) and Pascal/Z user groups. Over 5000 programs are listed with brief descriptions and ordering information.

The catalog is $5.00 postpaid ($7.50 overseas). Elliam Associates, 24000 Bessemer Street, Woodland Hills, CA 91367 (818) 348-4278. **Circle 60 on your reader service card.**

Network Systems

StarLink

Digital Research announced a combination hardware/software product called StarLink that expands an IBM PC into a multi-user system. StarLink can connect up to four terminals to an IBM PC and allow them to share files and software. StarLink consists of a board with a microprocessor and RAM packaged with the new Concurrent PC-DOS system (see "Computers & Systems").

Digital Research, 160 Central Ave., Pacific Grove, CA 93950 (408) 649-3896. **Circle 61 on your reader service card.**

Concurrent Network

AUTOCONTROL, Inc. announced the AC SOFT/NET board, designed to work with Concurrent CP/M-86 version 3.1 to connect a network of up to 255 IBM Personal Computers, PC-compatibles or workstations. The network uses a baseband distributed bus system with coaxial cable, allowing a distance of 7000 feet between computers. A dedicated file server is not needed; all computers on the network have continuous access to files.

The network software lets you run CP/M-86, MP/M-86, DR SOFT/NET and PC-DOS application software, with file and record locking. Additional features including multitasking, windows, graphics, resource-sharing and print spooling.

AUTOCONTROL, 11400 Dorsett Road, St. Louis, MO 63043 (314) 739-0055. **Circle 62 on your reader service card.**

SpiderNet

SpiderNet® (Artisoft, Inc.) is a complete Z80A-based computer system designed to control a network of six computers or peripherals using RS-232 ports for communication. For example, if you have four computers that need access to one printer and modem, SpiderNet provides an interface to connect all four computers to the single printer and modem, and adds the ability to communicate between the four computers.

SpiderNet can also expand one serial port into five, letting you connect five devices to one port and switch between them.

Artisoft, 2450 E. Speedway #4, Tucson AZ 85719 (800)821-6010. **Circle 63 on your reader service card.**

Communications

Telex-ing

Data Terminals and Communications (DTC) announces Tel-X-Plus, an add-on for the IBM PC or PC-compatible computer which allows the computer to communicate in background mode with Western Union's Telex service.

Tel-X-Plus keeps a running traffic log of both incoming and outgoing messages, has a time-date traffic stamp and remembers names, addresses and routing information from prior transmissions and receptions. Tel-X-Plus is a two-way system, and you can send and receive messages at 300 or 1200 baud. Tel-X-Plus turns a computer into an originate/answer station in true background mode that does not interrupt or interfere with regular applications running on the computer.

Tel-X-Plus is available from DTC; call (800) 962-8185; in CA call (800) 538-9294. **Circle 64 on your reader service card.**

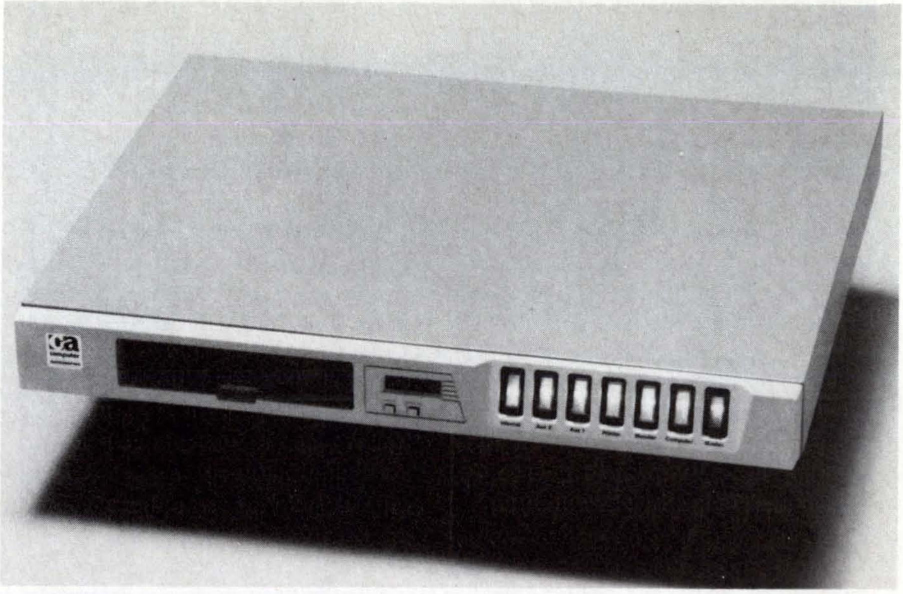
BBS Directory

The BBS Directory is a listing of computerized bulletin board systems in North America, categorized by location and type of computer. With each telephone number is information about the bulletin board (area of interest, type of computer, etc.). Over 700 listings; $5.95 postpaid. BBS Directory, P.O. Box 4150, Beach Station, Vero Beach, FL 32964 (305) 466-5515.

Circle 65 on your reader service card.

Another BBS Directory

The third printing of *National Computer Bulletin Board Directory* is now available. The directory contains over 1400 numbers organized by area code and state. The directory also has a key field identifying relevant information such as the bulletin board's baud rate, operating hours and other special comments. $2.00 postpaid: Thomas Wnorowski, 3352 Chelsea Circle, Ann Arbor, MI 48104. **Circle 66 on your reader service card.**



Computer Accessories' Power Director®.

Accessories

Power Control

Computer Accessories Corp. offers an "elegant" answer to power protection, expansion and control for personal computers and multiple-user systems. The Power Director® Model P12 is a sleek unit that provides six outlets with individual and master control switches, pilot lights, AC power pollution protection, equipment overload protection, digital clock and storage compartment for disks.

The power line circuitry blocks RFI and brings surges, spikes and glitches down to a level that the equipment can operate with. Suggested price is $199.

Computer Accessories, 7696 Formula Place, San Diego, CA 92121 (619) 695-3773. **Circle 67 on your reader service card.**

Cartridge Tape Backup

Alloy Computer Products, Inc. announced a high-capacity cartridge tape backup system designed for computers with the SCSI (Small Computer Standard Interface) controllers, such as those made by Digital Equipment Corp. (DEC), Fujitsu, ICL and Sanyo.

The unit can write up to 17.6 megabytes to a cartridge at the rate of one megabyte a minute. The unit has high-speed rewind, track select and a file orientation.

Alloy Computer Products, 100 Pennsylvania Ave., Framingham, MA 01701 (617) 875-6100. **Circle 70 on your reader service card.**

Instant Slides and Prints

Digital Research, Inc. announced an inexpensive method of producing high-resolution color slides and prints from computer graphics. Presentation Master combines DR Draw and DR Graph (which you use to design graphic images on the IBM PC screen), tutorial and diagnostic disks, a Polaroid computer image recorder, 35mm instant slide system and complete documentation.

With Presentation Master, and IBM PC user can create graphics, charts, text and drawings, then turn those images into slides or color prints instantly. The compute image recorder accepts data from DR Graph and DR Draw to reproduce each image on 35mm film, simultaneously matching or modifying colors to your choice from color exposure tables in the software. You can then process the film on the spot and produce finish slides in minutes, or color prints in seconds. Suggested price is $1995.

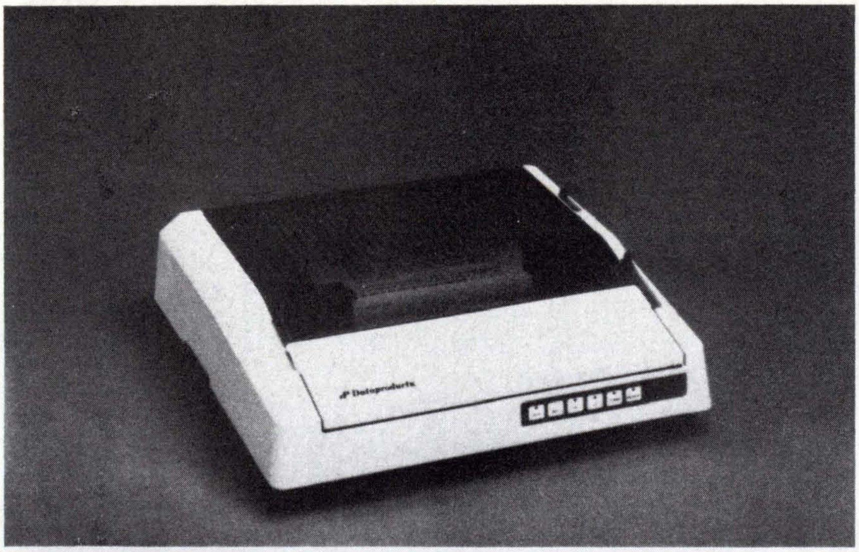
Digital Research, 160 Central Ave., Pacific Grove, CA 93950 (408) 649-3896. **Circle 68 on your reader service card.**

Fast Quality Printing

Dataproducts Corp. introduced the Model 8010 dot matrix printer that runs at different speeds for varying quality. It can print draft reports at 180 characters per second, text at 110 characters per second, and letter-quality text at 30 characters per second. Quality is achieved by a "dual pass" technique and a staggered wire print-head that forms letter-quality characters by passing over them twice.

The Model 8010 also has advanced paper handling features that automatically or manually position paper, and it supports a variety of character sets including eight international and three scientific sets.

Dataproducts Corp., 6200 Canoga Ave., Woodland Hills, CA 91365 (213) 887-8451. **Circle 69 on your reader service card.**



The Dataproducts Model 8010 serial dot matrix printer.

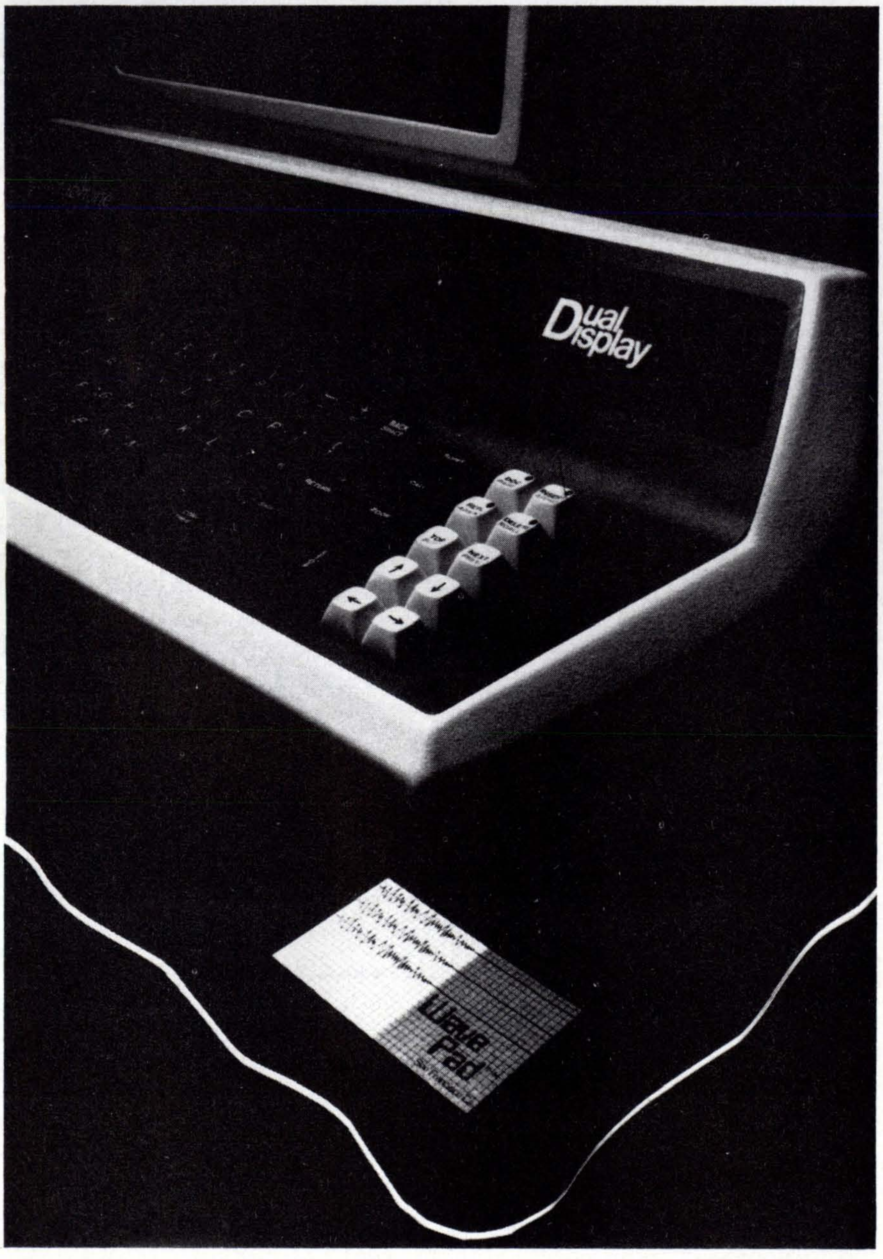
Good Vibrations

Wave Pad, a division of Western Rubber & Supply, offers twelve new sizes of office machine pads in four colors. The pads are made from natural open cell sponge rubber with a polyester surface, and are firm enough to support the heaviest of machines.

The pad maintains space between the bottom of your machine and the desk or table for air cooling. Thousands of tiny cells absorb sound and vibration. They are excellent for printers and other vibrating office machines, and they keep machines in place on tilted surfaces.

Wave pads are available through major office supply firms, stationery stores and computer supply firms. Wave Pad, P.O. Box 24475, San Francisco, CA 94124 (415) 777-WAVE.

Circle 72 on your reader service card.



The Wave Pad secures your office machine and muffles vibrations and noise.

Hoodwinked?

Sector Systems Company announced a CRT camera hood called the HOODWINKER®, used to help produce 35mm slides directly from a CRT screen. The HOODWINKER is only five ounces and attaches directly to your 35mm camera. You create the image on the CRT screen, position the HOODWINKER over the screen to shut out any light, and shoot.

You can take pictures in a fully lighted room. The HOODWINKER eliminates reflections and maintains accurate focus distance. Models are available for both 49mm and 52mm lens thread sizes. Suggested retail price is $49.95 plus $3 for shipping and handling.

Sector Systems Company, P.O. Box 751, Marblehead, MA 01945 (617) 631-2878. **Circle 71 on your reader service card.**

HOODWINKER

The HOODWINKER lets you take 35mm pictures of your CRT screen.

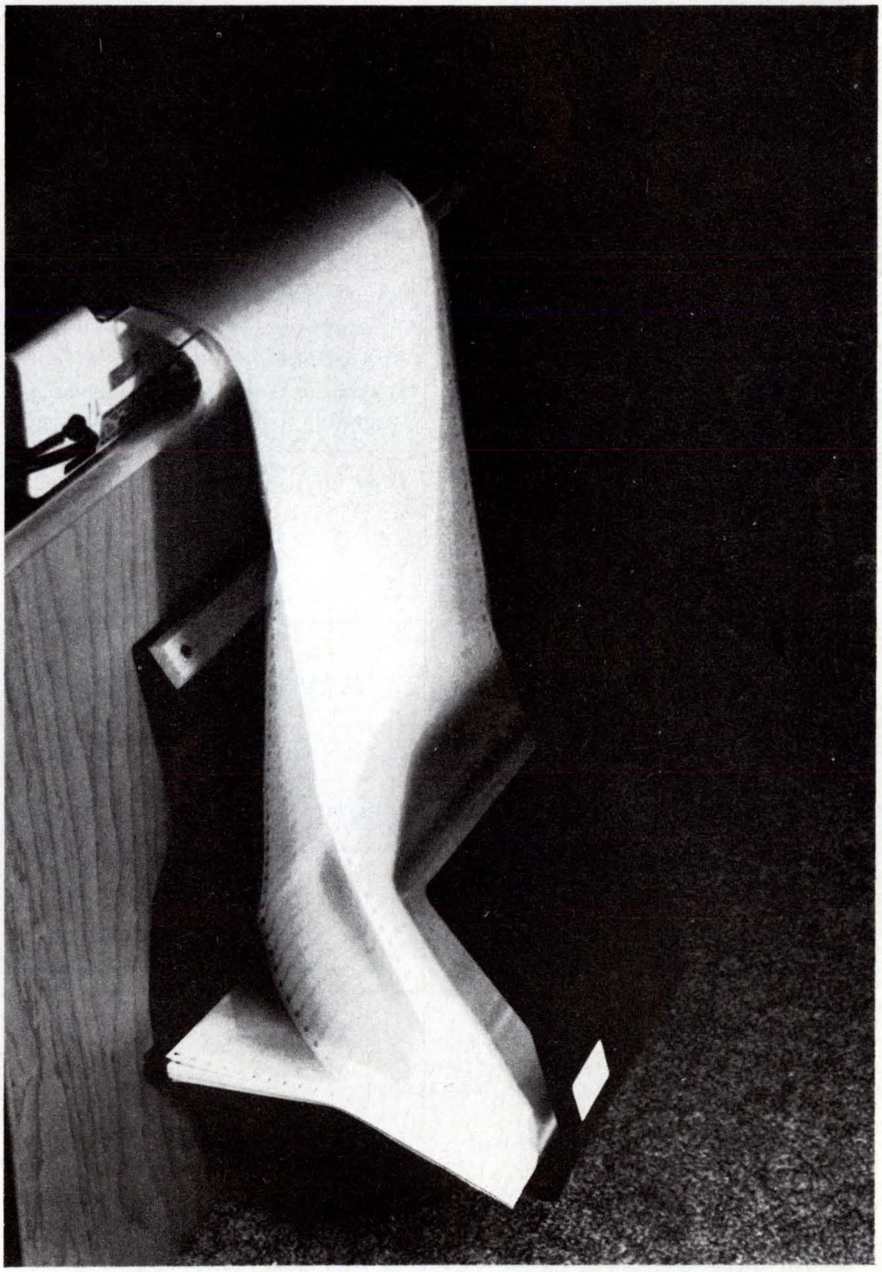
Paper Catcher

Kings Mountain Computer Products announced "the computer industry's first paper catcher" — the original Reformer® Paper Catcher® — designed to refold continuous feed paper or labels used with printers.

The Reformer Paper Catcher is ideal for printouts of more than five or six pages. It can catch paper or labels from three inches to sixteen inches wide and up to twelve inches fold-to-fold. It can hold more than 200 sheets of paper, and has no moving parts.

The catcher comes in two styles: Model FS, which is free standing on the floor, or Model WM, which can be mounted on a wall, desk or printer stand. The former's retail price is $44.95; the latter's retail price is $49.95.

Kings Mountain Computer Products, 13716 Skyline Blvd., Woodside, CA 94062 (415) 851-4219. **Circle 73 on your reader service card.**



The Reformer® Paper Catcher from Kings Mountain Computer Products.

For Starters

continued from page 69.

systems will be flexible to handle a variety of data formats. The Concurrent DOS ability to handle both CP/M-86 and and PC-DOS (MS-DOS) programs and data is an example of this compatibility. CompuPro is doing a version of this system that will also run standard eight-bit CP/M-80 software. Other computers (notably the Dimension computer) are being designed to run CP/M, IBM PC and Apple software.

We hope to see more flexibility in operating systems to allow you to set up several application programs to run without your intervention or having to type filenames or data. This functionality has long been available in UNIX-type systems, and is now becoming available in CP/M-compatible systems and in MS-DOS. We also hope to see programs take advantage of concurrency in the operating system to perform several tasks at once, such as printing while you continue to write and edit, or performing electronic mail services while you work in your spreadsheet. Your productivity with your computer will increase as you learn to take advantage of concurrency and data sharing among users.

Editorial

continued from page 4.

ware products are evaluated from the personal perspectives of users trying to solve problems. There are no "review guidelines" or pretensions about being "objective," because we think that software decisions are influenced by *style* and *gut feelings* as well as *immediate usefulness in a particular application.* How can anyone be objective about gut feelings and style? And how can anyone other than a *real user* judge a product's performance in a real application?

We are also formalizing something that has already appeared once in an issue: *the comparison article.* In this issue you'll find a comparison of two programs that do basically the same thing: keep a catalog of files in a disk archive. The programs are radically different in looks and appeal, but they are similar in function. There is no "objective" way to declare one better than the other. A comparison article doesn't usually make such a general choice, although the writer(s) make a choice for personal reasons.

We consider the comparison article to be the most useful kind of article to read before making a buying decision. By reading such a comparison you get a feel for both programs and a personal choice by the writer(s).

The personal user's viewpoint also appears in two new columns we are inaugurating: the User Forum, which starts with a positive reflection by Tom Howe on the state of "user friendliness," and Arthur Naiman's Sleaze Patrol, which chronicles the alleged nefarious and underhanded schemes of manufacturers, distributors, retailers, educators, consultants and even users (no one is exempt from the Sleaze Patrol).

In all our improvements to design, layout and typography as well as editorial integrity (if they are indeed improvements, and we think they are), we are striving to produce the quality that is so appreciated by *User's Guide* readers.

User's Guide is an intense personal effort, and its readers appreciate this. A considerable effort is put into making the tutorials *readable and entertaining* as well as useful. We are now putting that same effort into product comparisons and evaluations, to complement the tutorials and reference guides. The result should be a magazine that is both useful to someone thinking of buying a computer and useful to someone who is trying to use a computer. You tell us if we're coming closer to our goal.

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3. CompuPro	1
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5. EWDP Software	23
6. FOG (First Osborne Group)	49
7. Hawkeye Grafix	47
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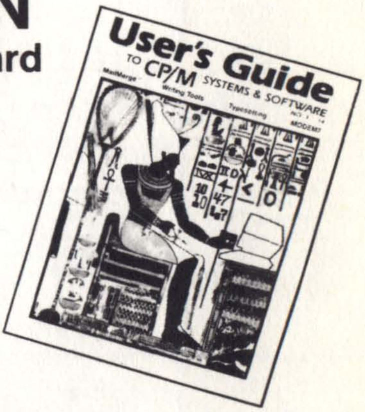
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A. Your computer experience?
1.☐ Novice 3.☐ Intermediate-advanced
2.☐ Semi-intermediate 4.☐ Advanced

B. Occupation?
1.☐ Executive/manager 3.☐ Professional
2.☐ Small bus. owner 4. ☐ Other

C. Use which computer(s)?
a. ☐ Apple b. ☐ IBM PC
c. ☐ CompuPro d. ☐ DEC
e. ☐ Osborne f. ☐ S-100
g. ☐ Radio Shack h. ☐ Heath/Zenith
i. ☐ TeleVideo j. ☐ Sanyo
k. ☐ Kaypro l. ☐ Compaq
m. ☐ Morrow n. ☐ Columbia
o. ☐ ____________ p. ☐ PC-compat.

D. Interested in which software?
a. ☐ Word processing b. ☐ Accounting
c. ☐ Communications d. ☐ Data base mgmt.
e. ☐ Medical/Dental f. ☐ Financial planning
g. ☐ Other vertical h. ☐ Scientific

E. Interested in which products?
a. ☐ Printers b. ☐ Modems
c. ☐ Hard disks d. ☐ Publications
e. ☐ Information services f. Other: ____________

F. Where do you use your computer?
1. ☐ Small business 5. ☐ Medium business
2. ☐ Profession 6. ☐ Home
3. ☐ School/training 7. ☐ Corporation
4. ☐ Construction 8. Other: ____________

G. Your immediate need?
1. ☐ Adding peripherals to present system
2. ☐ Upgrading system performance
3. ☐ Using information/communications services
4. ☐ Supplies and accessories

Name ____________ **Age** ______ **Sex** ____
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A. Your computer experience?
1.☐ Novice 3.☐ Intermediate-advanced
2.☐ Semi-intermediate 4.☐ Advanced

B. Occupation?
1.☐ Executive/manager 3.☐ Professional
2.☐ Small bus. owner 4. ☐ Other

C. Use which computer(s)?
a. ☐ Apple b. ☐ IBM PC
c. ☐ CompuPro d. ☐ DEC
e. ☐ Osborne f. ☐ S-100
g. ☐ Radio Shack h. ☐ Heath/Zenith
i. ☐ TeleVideo j. ☐ Sanyo
k. ☐ Kaypro l. ☐ Compaq
m. ☐ Morrow n. ☐ Columbia
o. ☐ ____________ p. ☐ PC-compat.

D. Interested in which software?
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c. ☐ Communications d. ☐ Data base mgmt.
e. ☐ Medical/Dental f. ☐ Financial planning
g. ☐ Other vertical h. ☐ Scientific

E. Interested in which products?
a. ☐ Printers b. ☐ Modems
c. ☐ Hard disks d. ☐ Publications
e. ☐ Information services f. Other: ____________

F. Where do you use your computer?
1. ☐ Small business 5. ☐ Medium business
2. ☐ Profession 6. ☐ Home
3. ☐ School/training 7. ☐ Corporation
4. ☐ Construction 8. Other: ____________

G. Your immediate need?
1. ☐ Adding peripherals to present system
2. ☐ Upgrading system performance
3. ☐ Using information/communications services
4. ☐ Supplies and accessories

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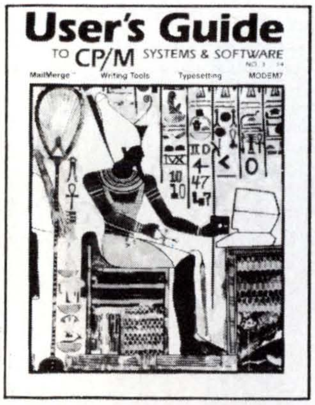
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> — Jerry Pournelle, ***Byte*** Dec. 1983

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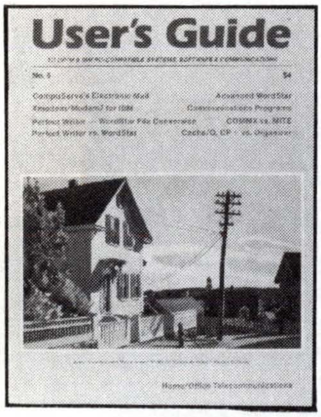
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